MAY 1961

FOOD ENGINEERING

A CHILTON PUBLICATION

FOR BETTER MANAGEMENT IN MANUFACTURING

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INGREDIENTS

FE SPECIAL REPORT

The 4th "INGREDIENT"

BUILDS SALES... yet never costs a penny!

Food manufacturers satisfied with only the finest quality ingredients have for decades been using STERWIN (1) color, (2) enrichment and (3) vanillin. The result has been ice cream, baked goods, candy, beverages (and many other food products) that look better, taste better . . . *sell better!*

STERWIN's 4th "ingredient" has played a major role, too, in much of this sales success . . . and never cost a penny! For this "ingredient" is STERWIN Service . . . practical suggestions and recommendations by STERWIN's Technically Trained Representatives that frequently cut production costs while helping turn out better selling food products.

These STERWIN Representatives are highly trained, broadly experienced men who constitute a nation-wide, on-the-spot task force for the more efficient production of food products. Small, medium and large food manufacturers have saved time, money, labor as a result of the sound advice and counsel offered by these sales-minded technicians.

If you use color, vanillin, enrichment . . . see your STERWIN Representative or write us direct. Learn how the 4 STERWIN ingredients can help your products look better, taste better . . . *SELL better.*

Sterwin Chemicals INC.

Subsidiary of Sterling Drug Inc.

1450 Broadway, New York 18, N.Y.

CIRCLE 2 ON INQUIRY CARD

FOOD
ENGINEERING
FOR BETTER MANAGEMENT IN MANUFACTURING

VOL. 33 NO. 5

May, 1961

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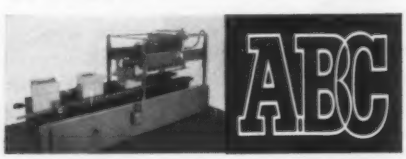
SPECIAL FE REPORT

Here is how today's food ingredients improve product quality, stimulate new-product development, and cut processing costs. Also, a look at the current food-additive situation.—p. 85.

helping hands—for sale now

Pressed again for shipping room time?
Plagued by off-again on-again delivery
schedules? Need extra hands now?
Consider the Dialmizer automatic case sealer.
Requires no daily cleanup at all.
Its glue applicators are hermetically sealed,
pressurized, too. Seals cases night
and day—automatically. ABC packaging
machinery works wonders. What particular
wonder do you want worked—tomorrow?



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ABC PACKAGING MACHINE CORPORATION
P.O. Box 1146, Clearwater, Florida

FOOD Engineering

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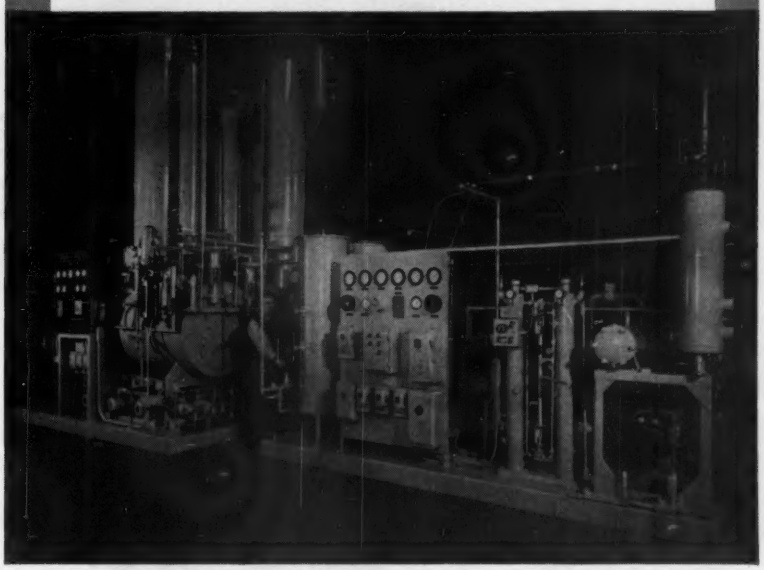
CO_2 AND NITROGEN MANUFACTURING SYSTEMS

for all food industry needs



The economical way to meet your constant demand for pure CO_2, dry ice and nitrogen

Food plants everywhere are turning to the specialists of DeMarkus for the answer to a more practical and economical way of satisfying their constant demands for pure CO_2 and Nitrogen used in their processing operations.

Large users of CO_2 and N_2 can enjoy tremendous savings with DeMarkus Packaged Systems because the efficient process used reduces production costs to about 1¢ per pound for CO_2 and less than 2¢ per 100 SCF for nitrogen.

Compare these costs with your current total expense for purchased gas and you see why more and more economy-minded, profit-wise food producers are buying DeMarkus Packaged Systems!

Standard DeMarkus Packaged Systems produce 50 to 500 lbs. of CO_2 per hour, 2800 to 28000 SCFH of nitrogen. Large-size custom-built plants are also available.

Let us send you complete information--even make a complete cost study for you--at no obligation. Write today.

DeMarkus also produces inert gas and hydrogen plants.

WRITE TODAY FOR DETAILS

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and DeMARKUS INTERNATIONAL CORPORATION
(Western Hemisphere outside U.S.A.)
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A NEW 4 in 1 FILLER by fmc

High Speed Filling of Juice · Liquid · Syrup · Brine

Illustrated 307 x 700 can in filling position

THE FMC 18 VALVE FILLER

FILLS CANS OR JARS—from 202 to 404 diameter, with a minimum number of change parts. It will handle containers from 200 to 800 tall by simple vertical adjustment of filler bowl.

HIGH SPEEDS: up to 400 cpm depending on product and container size. Chain feed, worm timer and tangential take-off contribute to smooth, gentle handling.

HANDLES A WIDE RANGE OF PRODUCTS:

Liquids and juices: including tomato juice, peach and pear nectars, pineapple-grapefruit juice drink, pineapple juice.

Syruping: such as peaches, apricots, pears, fruit cocktail, figs, cherries.

Brining: adds brine to such products as spinach, diced carrots, green beans, peas, small potatoes, dry beans, pork and beans.

HIGH ACCURACY: extraordinary open-vent gravity-type valve design permits the valve's vent tubes to *drain completely* before cans leave the machine, providing greatest accuracy and uniformity of fill at high speeds. Can-lifts give positive, automatic "No Can, No Fill" operation, reducing the problems of spillage and waste. Head space is readily adjusted.

FULL AND COMPLETE DETAILS on this highly versatile FMC Filler will be furnished promptly by your FMC representative. Write or call today.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

Canning Machinery Division

General Sales Offices:

WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

TRENDS & FORECASTS

Gain of 3% in net income after taxes in '60 is reported for baking and dairy companies. Meat packers' net dropped 18%, sugar refiners', 12%. Soft drink bottlers were off 1%, but brewers gained 8%.

Hourly earnings increased 80% between '47-'49 and '60 for workers in food plants. Labor costs per unit gained only 30% because of increased output per manhour, according to W. H. Waldorf, USDA.

Meals sold through vending machines skyrocketed from $10 million to $200 million between '54 and '60, *Fast Food Magazine* reports. Most of expansion is for in-plant feeding—to cut costs compared to cafeteria.

Total crop planting this year is placed at 330 million acres, about same as in '60. Feed grain acreage is expected to decline slightly while that for food grain increases.

Prospective acreage of seven principal vegetable crops for commercial processing is 9% above '60. Increases are: lima beans, 12%; snap beans, 7%; cabbage for kraut, 6%; sweet corn, 9%; green peas, 13%; tomatoes, 7%. Spinach is off 4%.

Cranberry sauce pack fell 39.3% last year to 4.2 million cases. Canned okra dropped 13.8% to 622 thousand cases. Canned pears were off 9.45% to 10.7 million cases. Pimientos gained 17.8% to 2.6 million cases.

Exports of variety meats shot up 33% in '60 for new record of 121 million lb. Increased trade with United Kingdom and France, following easing of restrictions, accounts for most of gain.

Cocoa beans processed in U. S. gained 5.6% in 1st quarter of '61 to 134.2 million lb. Trend reflects lower cost of beans and continued increase in consumption, says Dept. of Commerce.

Production of edible gelatin rose 9.14% in '60 to 42.7 million lb. Total gelatin output gained 5.65% to 59.7 million lb., Dept. of Commerce reports.

Americans spend more than $18 billion annually for food away from home. Total institutional food sales equals retail food store sales in 143 leading metropolitan areas, according to Institutional Food Manufacturers Assn. By 1975, away-from-home food bill is forecast at $36 billion.

Per capita consumption of fishery products last year was 10.5 lb. edible weight, down slightly. Fresh and frozen fish accounted for 5.9 lb.; canned, 4 lb.; cured, 0.6 lb., according to Dept. of Interior.

See Developments to Watch p. 15

YORK Centrifugal Compressors Have Continuously Variable Capacity

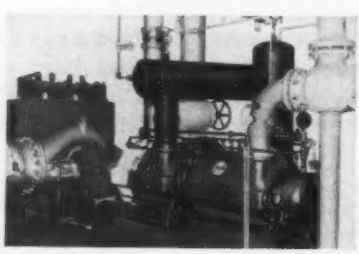
—Follows product load curve automatically

PRE-ROTATION VANE CONTROL—Standard on all multi-stage Turbomasters, this infinitely variable control provides automatic, efficient capacity reduction. Refrigeration capacity is always in direct proportion to product load.

VERSATILE—Turbomasters are adaptable to brine cooling systems, large ammonia systems, and process water cooling systems from 75 tons refrigeration upwards. Units to meet your process requirements regardless of temperature level.

CLEAN, SIMPLE DESIGN—400 fewer parts than conventional models. Smooth rotor and impeller design—short, stiff shaft—flexible, non-wearing shaft coupling—integral centrifugal oil pump—all contribute to dependable operation.

MAINTENANCE REDUCED—Simplified centrifugal design cuts wear. Bearing replacement easily made without removing casing. One unit holds several operations at various temperatures. Well-suited to economical constant speed drive.



Another YORK Trail Blazer Concept Proved In Action at *John Morrell Co., Sioux Falls, S. D.*—York Turbomaster ammonia Compressor delivers 1,000 tons refrigeration at 5°F. Nine stage tandem unit has 1,720 hp turbine drive. Intercooler between casings and interstage injection provides efficient gas cooling.

YORK CORPORATION
Subsidiary of Borg-Warner Corp.
YORK, PENNSYLVANIA

2205 SOUTH GRANTLEY ROAD, YORK, PENNSYLVANIA

Air Conditioning, Heating, Refrigeration and Ice-Making Equipment • Products for Home, Commercial and Industrial Applications

Schedule of Events

May

3-13—5th U. S. World Trade Fair, New York Coliseum, NYC.
7-10—Super Market Institute, meeting, McCormick Place, Chicago.
7-11—Institute of Food Technology, convention, Statler Hotel, NYC.
9-11—Material Handling Institute, Inc., show, Philadelphia Trade & Convention Center, Philadelphia.
14-17—Flavoring Extract Manufacturers Assn., meeting, Savoy-Hilton Hotel, NYC.
21-24—Biscuit & Cracker Manufacturers Assn., and Biscuit Bakers Institute, meeting, Mayflower Hotel, Washington, D. C.

June

5- 9—Nat'l Plastics Exposition, New York Coliseum, NYC.
11-15—Nat'l Confectioner's Assn., 78th Annual Convention & Exposition, Conrad Hilton Hotel, Chicago.
18-22—Nat'l Assn. of Retail Grocers of the U. S., 62nd Annual Convention and Exhibit, Convention Hall, Philadelphia.
18-23—Assn. of Food and Drug Officials of the U. S., Nat'l Conference, Mayflower Hotel, Washington, D. C.
19-21—American Marketing Assn., National Conference, Los Angeles Ambassador Hotel, Los Angeles, Calif.
21-24—Processed Apples Institute, Inc., 10th annual meeting, Greenbrier White Sulphur Springs, West Virginia.
23-24—American Society of Enologists, 11th annual meeting, Hoberg's, Lake County, California.

HORS D'OEUVRES

"To the millions who have to go without two meals a day, the only acceptable form in which God dare appear is food." So observed the great Mahatma Ghandi, who never heard of "built-in maid service."

Senator Neuberger's air pollution control bill is aimed at removing garbage in the sky. He apparently realizes that the politician's pie in the sky eventually spoils.

Children of the ages three to ten can devour or damage supermarket profits to the extent of $3,700 a year, or more, a study shows. But their presence in supermarkets costs parents much more than that.

Meat packers are being held to the 40-year-old consent decree which bars them from retail food operations. Yet supermarket chains are allowed to operate meat packing plants. The packers should squeal to consumers.

Youngsters prefer hamburgers, to frankfurters, to steak. Need more proof that their judgment is immature?

One stormy night he had an accident. A high tide swept the beach, and fingers of foam inched their way up the Boardwalk until, at last, all his candies were completely drenched. —No mystery. Just the true beginning of salt water taffy at Atlantic City.

Are you an econometrician. That's an expert who applies statistics to management problems. He doesn't guess. He calculates his mistakes.

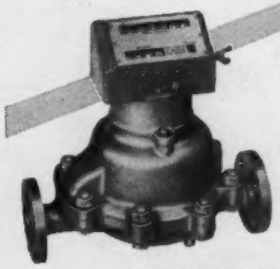
When You Specify Niagara

You get more than just a meter

YOU GET
accurate measurement of liquids plus time and labor-saving features... more consistent product uniformity... more complete data for process control, inventory and cost accounting. You can measure liquids under pressure to avoid loss of volatile products... measure cold, or hot, corrosive liquids... and, heavy liquids, even molten sulphur.

YOU GET
the widest choice of metering instruments and components. Only NIAGARA offers a full line of Bronze, Galvanized Iron and Stainless Steel units for flows from as low as 1 gpm to as high as 1000 gpm, depending on liquid viscosity... And only NIAGARA offers a wide choice of measuring components. You can literally "build" a meter to satisfy your liquid needs.

YOU GET
complete control flexibility plus a selection of registers to meet your specific need... Horizontal totalizers for accounting and record keeping; Inclined Set-Back for recording each batch and total; 6" and 10" Vertical Dials for distance reading; and Electrically Operated Mechanisms for unattended operation and control features that bring automation to processing applications.



ONLY FROM NIAGARA do you get a complete selection of metering elements to meet every liquid handling need... For more than 67 years NIAGARA has pioneered in providing the finest measuring instruments designed for long-life, and trouble-free performance. Our Engineering staff welcomes your inquiry and is eager to assist you. Write today for complete metering information.

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SUBSIDIARY OF AMERICAN METER COMPANY

CIRCLE 9 ON INQUIRY CARD

No wonder his wife leaves the packing to him!

You can count on Union-Camp box designer Bob Pyle to come up with the most efficient corrugated interior packing—no matter what the product or how it is shipped.

THE GLASS BOWL in our picture is safe enough in Bob Pyle's hands. The trick is to see that it travels just as safely once it is packaged.

This takes an unusual combination of skill and experience. The kind Bob is known for. Bob is one of a team of Union-Camp corrugated box engineers who specialize in *interior* packaging of a product.

It's a challenging specialty. Just consider the problems of packaging a television set, for instance. Says Bob: "The set must be *locked* in position and perfectly cushioned against shock. Then we have to allow sufficient clearance on all sides so that the *finish* is protected against scratches. And the box should have sufficient stacking strength so that it can be tiered up high in the warehouse.

"Then there's the packing operation to consider. The box must be adaptable to high-speed assembly line operation so that the job can be done as quickly and cheaply as possible—consistent with the protection needed."

Other products, Bob points out, may call for different types of safeguards in the package. To keep out dust. To prevent corrosion or spoilage. Actually, the forms of inner packing are as varied as the items they protect.

Some of these items are well-known: food products, canned beverages and appliances, for example. But some others may surprise you. High-voltage equipment weighing over 300 pounds. Centrifugal pumps. Heavy industrial sewing machines. Formerly they required expensive crating. Now they travel safely and economically in custom-tailored containers developed by Union-Camp box designers like Bob Pyle.

Oddly enough, small-cost items often can create the biggest problems. One case in point was a lamp sold in variety stores for only $2.98. It was made of a fragile plastic, and the manufacturer's profit margin was so low that he had almost no budget for the intricate packaging that would seem to be necessary for proper protection. Bob Pyle devised a simple, inexpensive inner packing unit. To date, not a single lamp has reached its destination in a damaged condition!

Could a Union-Camp box designer like Bob Pyle help improve your product's protection, reduce your packaging and shipping costs? The answer is as near as your telephone. Call in a Union-Camp corrugated box representative. He'll tell you about our complete packaging evaluation program. It includes package analysis, box design and development, specifications control, merchandising counsel and in-plant surveys of your materials handling operation.

Or, a note on your letterhead will bring a prompt reply. Why not write today?

UNION-CAMP*
CORRUGATED BOXES

Union Bag-Camp Paper Corporation · 233 Broadway N.Y.7, N.Y.

Plants:

*Dedham, Mass.: Allied Container Corp., Route 128, Allied Drive
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†Cleveland, Ohio: 10200 Miles Ave.
†Sharonville, Ohio: P.O. Box 86
Chicago, Ill.: 4545 West Palmer
†Benton Harbor, Mich.: 11th St. & Britain Ave.
†Monroe, Mich.: 1109 East Elm Ave.
†Eaton Rapids, Mich.: P.O. Box 8
*Baltimore, Md.: Eastern Box Co.: Wagner's Point
Jamestown, N.C.: 3704 Point Pleasant Rd.
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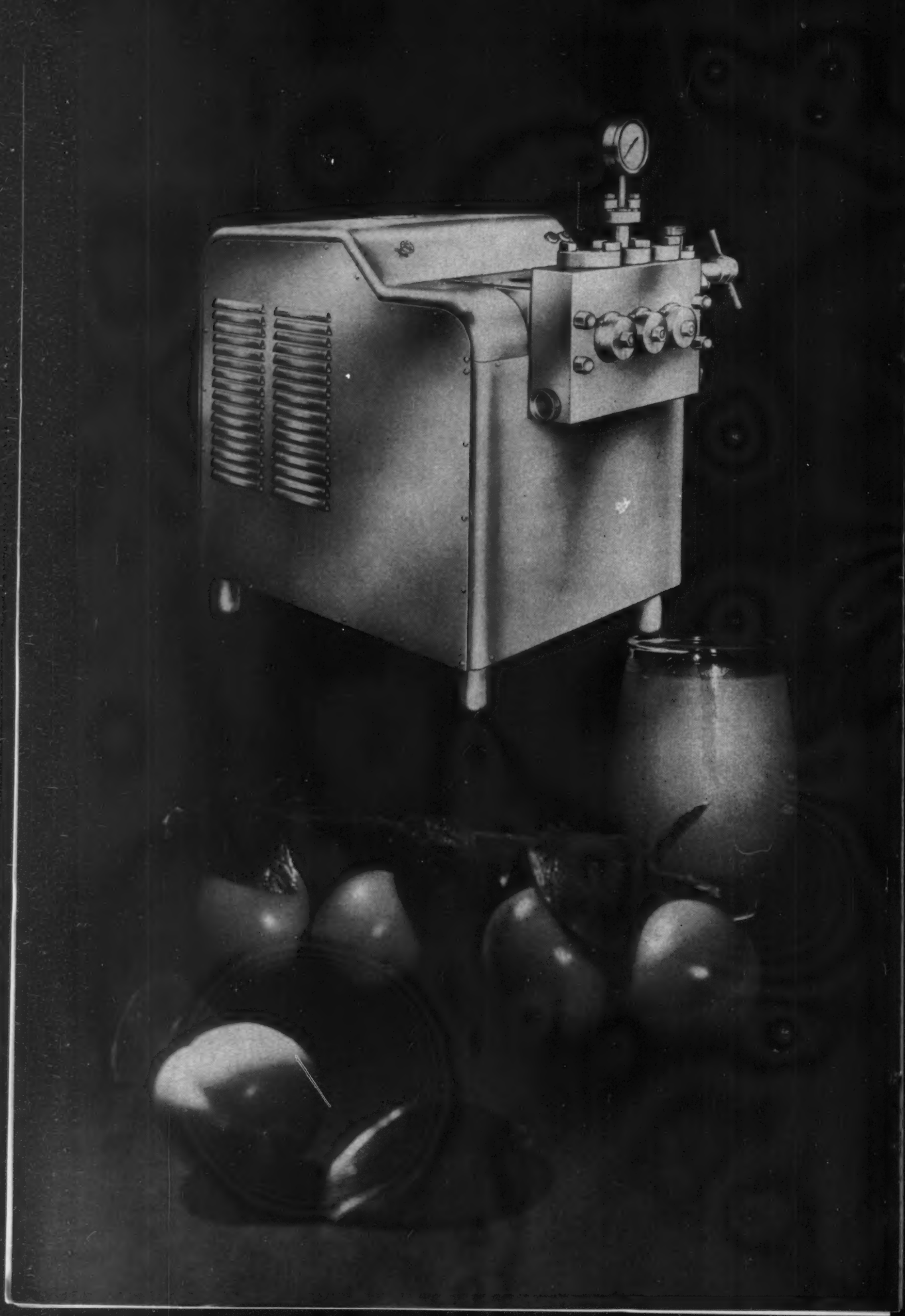
Savannah, Georgia: P.O. Box 570
Lakeland, Florida: P.O. Box 484

*Subsidiary Companies †River Raisin Division



Cherry-Burrell prevents flavor fallout in apricot nectar

One Eastern processor of apricot nectar had a problem with his product. The apricot concentrate separated from the water and fell to the bottom. And with it went the flavor. Since he packaged his nectar in glass, the unattractive fallout hurt sales. He asked Cherry-Burrell to solve his problem.*

Cherry-Burrell engineers studied the situation, tested the product in Cherry-Burrell laboratories, and recommended a Superhomo Homogenizer. The product was shot through the Cherry-Burrell Superhomo under tremendous pressures and velocities, subjected to sudden, violent changes of direction. This *explosive* action broke up the concentrate globules into tiny flavor drops that stayed in suspension, never separated. The process gave the nectar an appetizing appearance, even improved its flavor. The Superhomo recommended is just one in a long line of Cherry-Burrell homogenizers.

Highly trained technicians will test *your* product without obligation, in a Cherry-Burrell laboratory. They will show you how Cherry-Burrell food processing equipment can help you improve your operation and profit position. Your specialists are invited to participate in the testing. Call or write Cherry-Burrell today.

**Case history on request*

EQUIPMENT FOR HOMOGENIZING, HEATING, COOLING, FLAVORIZING, STORING, SEPARATING, FREEZING, MIXING, PACKAGING AND CONVEYING. WRITE FOR YOUR FREE CATALOG.

CHERRY-BURRELL CORPORATION
CEDAR RAPIDS, IOWA

CIRCLE 13 ON INQUIRY CARD

NEWEST DATA / ROCHE® Beta CAROTENE

The SAFE yellow-to-orange COLOR that NOURISHES

Roche has all the types of beta carotene you'll need, no matter what you're processing. Roche packings are made with your needs in mind. Summarized below is information you'll find helpful—

TECHNICAL INFORMATION —Beta CAROTENE Roche crystals

Crystalline Beta CAROTENE Roche is in the all-trans form. It is not a mixture of isomers of varying coloring value. Roche Beta CAROTENE is 100% provitamin A, the preferred carotene for use in foods.

Empirical Formula:	$C_{40}H_{56}$
Molecular Weight:	536.85
Melting Point:	183.0

Appearance: Red-violet platelets

Solubility in Edible Oils:

At room temperatures about 0.08%
At 45° C 0.2%
At 140° C ..... 6.0% *

Biological Properties:

0.6 microgram of beta carotene = 1.0 U.S.P. unit of vitamin A
1.0 gram of beta carotene = 1,666,667 U.S.P. units of vitamin A

*Carotene will recrystallize on cooling. One percent solutions will remain dissolved for approximately 8 hours at room temperature. Some isomerization and destruction take place at this temperature.

MARKET FORMS & PACKINGS— Beta CAROTENE Roche

Crystalline Beta CAROTENE—1,666,667 U.S.P. units of vitamin A activity per gram.

Packed: in polyethylene bag in hermetically sealed sanitary can containing 100 grams.

30% Beta CAROTENE in vegetable oil—500,000 U.S.P. units of vitamin A activity per gram. In vegetable oil. Each gram contains 0.30 gram of beta carotene.

Packed as follows: 1 pound (0.4536 kilo) and 3 pounds (1.361 kilo) in Tripletite Tamperpruf metal can. 33 pounds (14.97 kilo) in steel pail, Synthetasine-lined, Leverlok Tamperpruf cover.

24% Beta CAROTENE, Semi-Solid Suspension—400,000 U.S.P. units of vitamin A activity per gram. In vegetable oil. Each gram contains 0.24 grams of beta carotene.

Packed: available in 1 pound (0.4536 kilo) and 3 pounds (1.361 kilo) Tripletite Tamperpruf metal containers.

Beta CAROTENE and Vitamin A Blends—Roche Beta CAROTENE and Roche Vitamin A (acetate or palmitate) are blended in vegetable oil according to your specifications. A range of potencies is available, including high-potency blend with no oil dilution. *Packed:* in sealed, sanitary, batch-size cans.

Beta CAROTENE Blends—Dilutions of Beta CAROTENE Roche are made in vegetable oil. Minimum dilution—6% which is equivalent to 100,000 U.S.P. units of vitamin A activity or 0.06 gram of beta carotene per gram of blend.

Packed: in batch-size, sanitary sealed cans.

Dry Beta CAROTENE Beadlets, Type 2.4-S—Water-dispersible, free-flowing beadlets. Each gram contains approximately 40,000 U.S.P. units of vitamin A as beta carotene.

Packed: in polyethylene bags in fibre drums up to 50 kilos. Also in polyethylene bags in one- and two-kilo Tamperpruf metal containers.

USE IN FOODS

Safe-Sure-Yellow-Pure Roche Beta CAROTENE gives SAFE yellow-to-orange color and nutritional value to such foods as:

Margarine—Salad & Cooking Oils—Mellorine & Ice Cream Products—Pie Crust & Cake Mixes—Shortening—Baked Goods—Fruit Drinks, Fruit Juices & Concentrates—Puddings & Egg Yolk Products—Frozen Foods—Gelatin Desserts—Confections—Dessert Toppings—Popcorn—Cheese—Soups—Creamed Foods.

Safety Proven. Beta carotene, one of nature's own colors in foods, has been consumed for thousands of years. Despite this evident record of safety, Roche did not market its beta carotene until it had been tested over a long period of time for acute and chronic toxicity. These tests proved beyond doubt that Roche Beta CAROTENE is *safe*.

Nutritive Value. Roche Beta CAROTENE is a provitamin A. It is converted within the human body to vitamin A.

Stability. Excellent stability has been demonstrated by extensive laboratory tests and years of widespread commercial use.

True Color. Roche Beta CAROTENE gives foods true, natural-looking color without any tinge of green. No change to a reddish color happens during storage, as may occur with some vegetable pigments.

Technical Service and Samples are yours for the asking. Your Roche salesman will help, or phone or write Roche directly.

ROCHE
ROUND THE WORLD

Vitamins come RIGHT from Roche

FINE CHEMICALS DIVISION **HOFFMANN-LA ROCHE INC.**

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OPMENTS TO WATCH

Fresh tomato slices can be frozen in liquid nitrogen, Air Reduction reports. Corn is frozen on cob and shelled for whole kernels. Citrus segments are frozen and crushed into individual cells.

Hamburgers frozen in liquid nitrogen are juicier and tastier than those conventionally frozen, Liquefreeze says.

Cost of reliquefying system is reduced if liquid nitrous oxide is used instead of nitrogen in immersion freezing. Volume of gas to be compressed is less, liquefying temperature higher.

New Bartelt machine forms, fills, seals envelopes at 600/min.

Transparent polyethylene frozen food containers that are thermoformed and heat sealed are du Pont innovation.

Poly-coated carton blanks are set up by machine no larger than typewriter at Forty Fathoms Fisheries. Carton seals air-tight.

Visual inspection of heat-seal quality in transparent films and laminates is possible with a new polarimeter developed by du Pont.

Titanium is becoming competitive on cost and performance basis. Titanium sponge price is $1.60/lb., $1.15 less than in '57.

Flows of two liquids being blended are controlled to 0.5% accuracy by new Fischer & Porter system. Turbine flowmeter in each line feeds rate-of-flow impulses to actuate electronic control.

Frozen 900-calorie item is National Dairy innovation. Container is portion-marked for 4 servings. Borden has tested "900" iced milk.

Additive extensions previously granted or pending continue until July 1, '61.

Animal protein in form of "fish flour" made from nonutilized fishes looks promising as supplement to diets of protein-starved peoples.

Freeze-drying is used by American Institute of Baking as research tool. It preserves heat-sensitive biological materials until tests are completed.

Solid cinnamon has been experimentally dissolved in sorbitol, filtered, solidified and pulverized to yield water-soluble flavor concentrate.

Cod fish is tested photoelectrically at Britain's Torry Research Station. "Milkiness," or poor condition, is indicated by amount of light passing through sample.

A lot of people (whom we'd like to have as customers) look twice when they see the prices on our new liquid-filled dial indicating thermometers. We don't blame them. They're used to paying 200% more. Our prices are shockingly low. How do we do it? Simple!

We have designed a clever universal mount. One mount satisfies many installation problems (reduces production and stocking costs and allows lower prices to you). We save on the unique but rugged outer casings, too. (So you save even more). But corner cutting ends here. These devices are devils for durability. Built tough to take it. Dials are big, legible, raised to reduce parallax reading error. They are sidelighted to provide better illumination. Inside? Strictly precision. The mechanisms; solid liquid-filled Bourdon tubes, are made and calibrated completely by hand (ever so carefully) just to insure reliability, accuracy, and long life.

They are direct acting... no gears or cams to wear or fail. We guarantee every one to meet full industry specifications. So look twice at the price if you like, but look twice at the instrument, too. It is just one of a complete line of Autolite instruments that will change your opinion on how much quality costs in today's market. Another reason why you're always right with Autolite.

AUTOLITE
INDUSTRIAL INSTRUMENT DIV. • PORT HURON, MICHIGAN

Who's Building What ...

Monthly Reports: These food firms will spend $17,478,487 for expansion.

Contracts Awarded

Brock Candy Co., Chattanooga, Tenn., candy plant, $600,000.

Cook Coffee Co., Cleveland, meat packing plant, $175,000.

Cornland Dressed Beef Co., Lexington, Neb., processing plant, $135,250.

Falls City Brewing Co., Louisville, Ky., warehouse. $263,000.

Georgia Poultry Improvement Assn., Gainesville, Ga., poultry laboratory, $184,958.

Jacobs Packing Plant, Nashville, Tenn,. meat packing plant, addn., $149,400.

Meyer Bros., Inc., Richmond, Va., meat packing plant, addn., $125,000.

Mothers Food Products, Elizabeth, N. J., warehouse, $1,800,000.

Mrs. Stratton's Salads, Inc., Birmingham, Ala., food mfg. plant, $125,879.

National Biscuit Co., Chicago, baking plant, addn., $8,100,000.

Uncle Ben's Inc., Houston, Tex., bean processing plant, $510,000.

Wakefern Food Co., Elizabeth, N. J., perishable foods plant, $2,500,000.

Proposed Projects

A&P Tea Co., Fort Fairfield, Me., potato processing plant, $1,000,000.

Badger Turkey Industries, Marshfield, Wis., turkey processing plant, $250,000.

Campbell Soup Co., Paris, Tex., food processing & can mfg. plant, $1,000,000.

Pepsi-Cola of Canada Ltd., St. James, Man., bottling plant, $200,000.

Richter's Bakery, Victoria, Tex., warehouse, $110,000.

Toronto Macaroni & Imported Foods Ltd., Montreal, Que., warehouse & office, $250,000.

stops sticking

speeds packaging

cuts cleanup

saves money

SLIPICONE

silicone release agent

"wherever sticking is a problem"

SLIPICONE® goes on in a breeze . . . makes any surface slick . . . keeps adhesives, packaging materials and foods from sticking or piling up where you don't want them . . . keeps equipment cleaner, more sanitary . . . assures neat, attractive packages and labels.

SLIPICONE is nontoxic . . . safe to use in contact with all foods. Stays effective over a broad temperature range . . . from 40 below to 400 above zero!

SPRAY OR WIPE IT ON

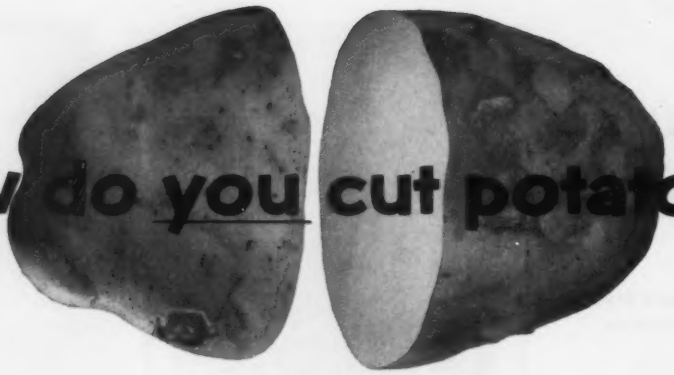
SLIPICONE comes in four handy sizes: 12 oz. aerosol can; 2 and 8 oz. tubes; 10 lb. can . . . all economical to use.

Get SLIPICONE from your paper merchant, packaging materials supplier, or write Dept. 3717 for name of nearest distributor.

first in silicones

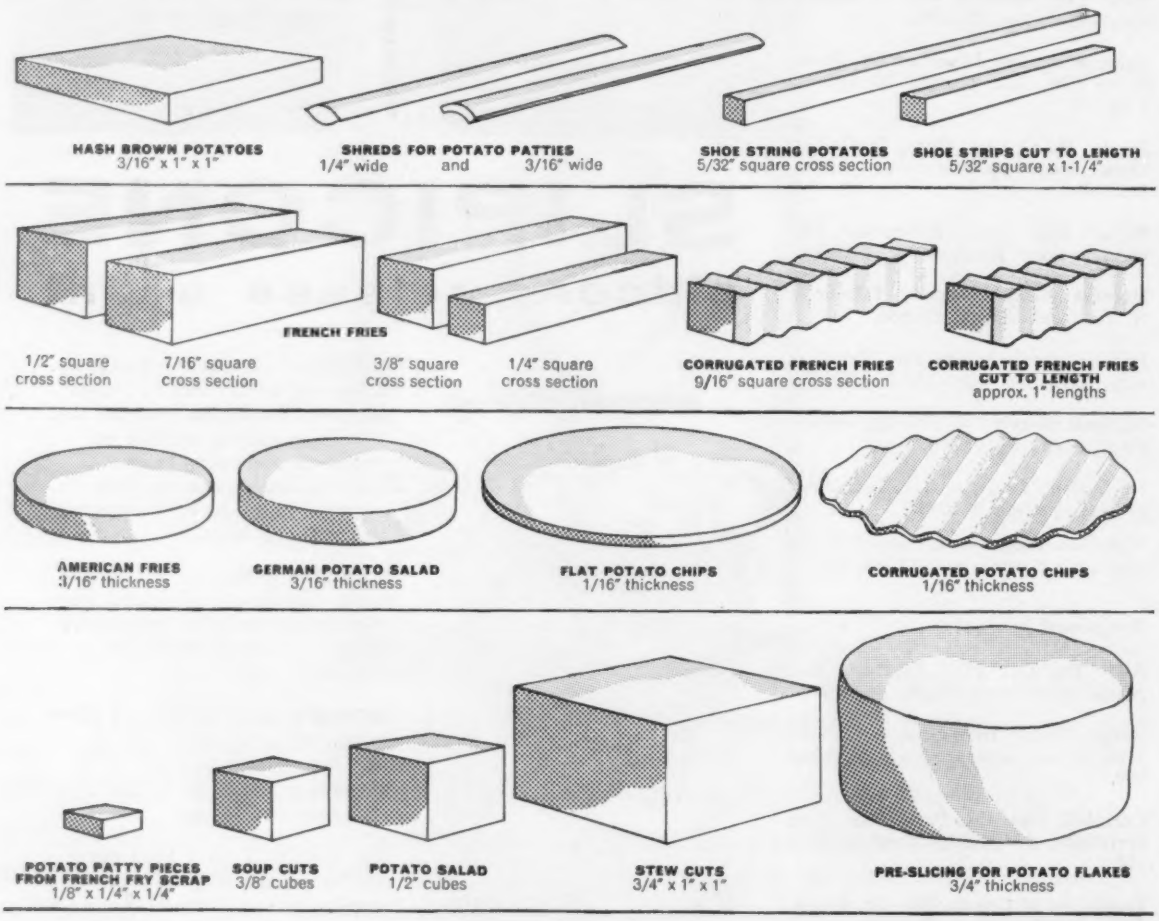
Dow Corning CORPORATION
MIDLAND, MICHIGAN

CIRCLE 17 ON INQUIRY CARD



how do you cut potatoes ?

New potato shapes, created to *revitalize* lagging appetites, are making important sales news all along the nation's shopping fronts. Urschel machines can cut practically any shape you want. They feature precision uniformity, highest yields, lowest product loss, unusually high capacities, low maintenance, and complete product protection (product contacts only stainless steel or special non-corroding metal surfaces).

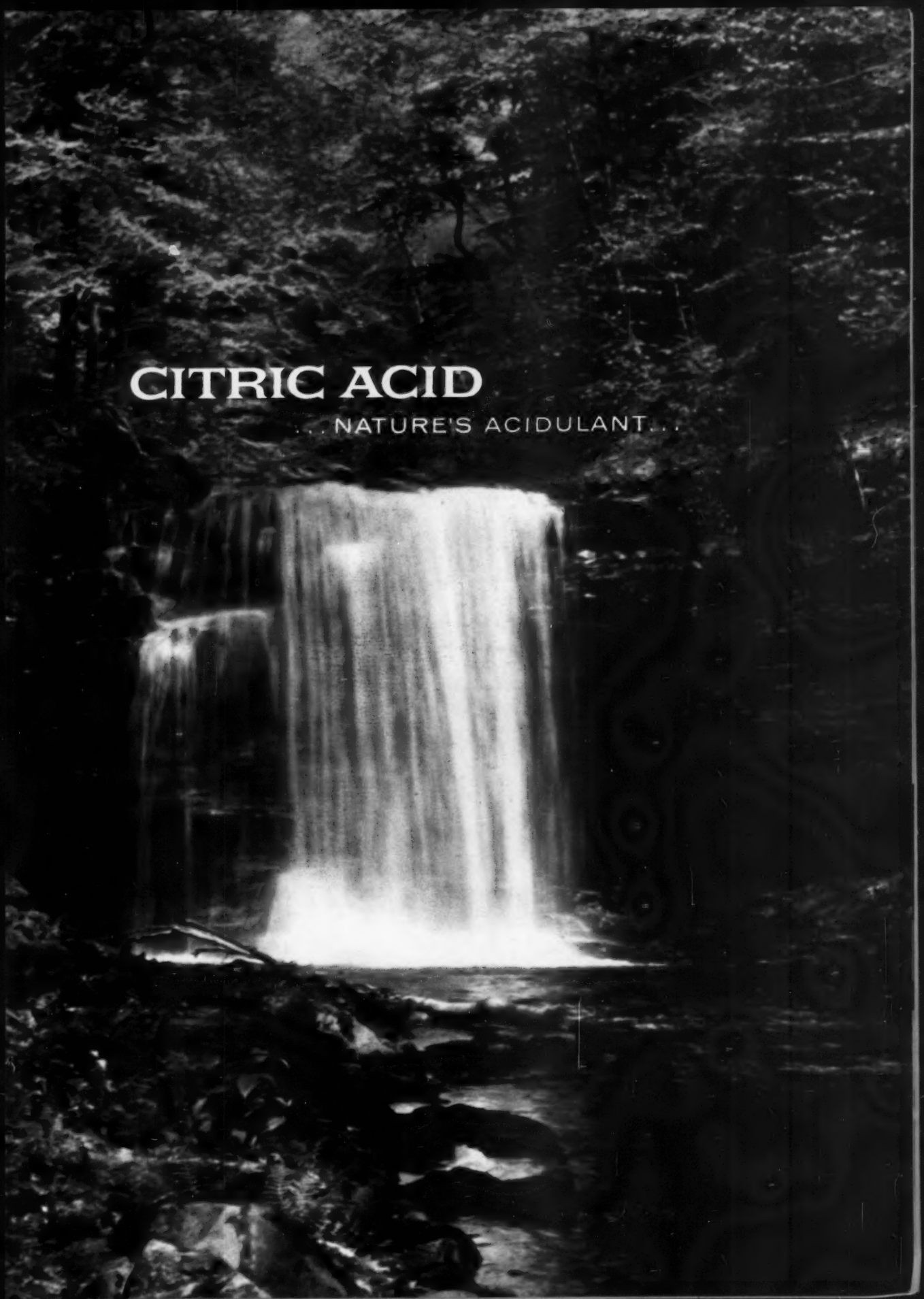


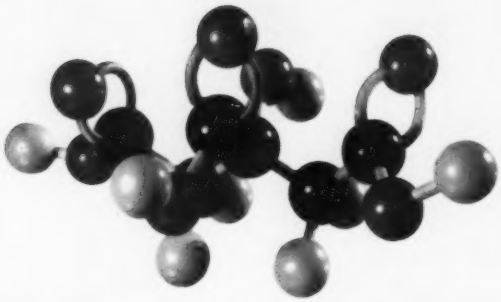
Consult with our cutting specialists

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products.

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT


CITRIC ACID
. . . NATURE'S ACIDULANT . . .



Pfizer

CITRIC ACID

Nature's Acidulant

best for your fruit-flavored foods

So many fresh fruits get "tanginess" naturally from citric acid! This is nature's way of bringing out their full flavor.

Exactly the same kind of tanginess is insured in your fruit-flavored soft drinks, candies, jellies and many other products—by Pfizer Citric Acid.

Indeed, Pfizer Citric Acid has been a key product to the food industry for many years. The words "citric acid" on countless labels have established it as a familiar and trusted ingredient.

Don't gamble on quality and consumer acceptance with anything less than nature's acidulant —citric acid!

How Pfizer Pioneered in Production of Citric Acid in America

While the advantages of citric acid as a food ingredient have long been appreciated, the supply was at one time quite limited. Up until 1880, virtually all the citric acid used in this country was made in Europe. In that year, Pfizer conceived the idea of importing the raw materials from abroad and producing citric acid in the United States. The results were successful and Pfizer gradually became a leading manufacturer of this important commodity.

But production still depended on raw materials supplied from overseas. In a far-sighted decision around the turn of the century, Pfizer began to experiment with methods of producing citric acid from domestic materials. In 1914, this research program focused on the possibility of fermenting citric acid from a sucrose base. Five years later, Pfizer opened a pilot plant employing such a process.

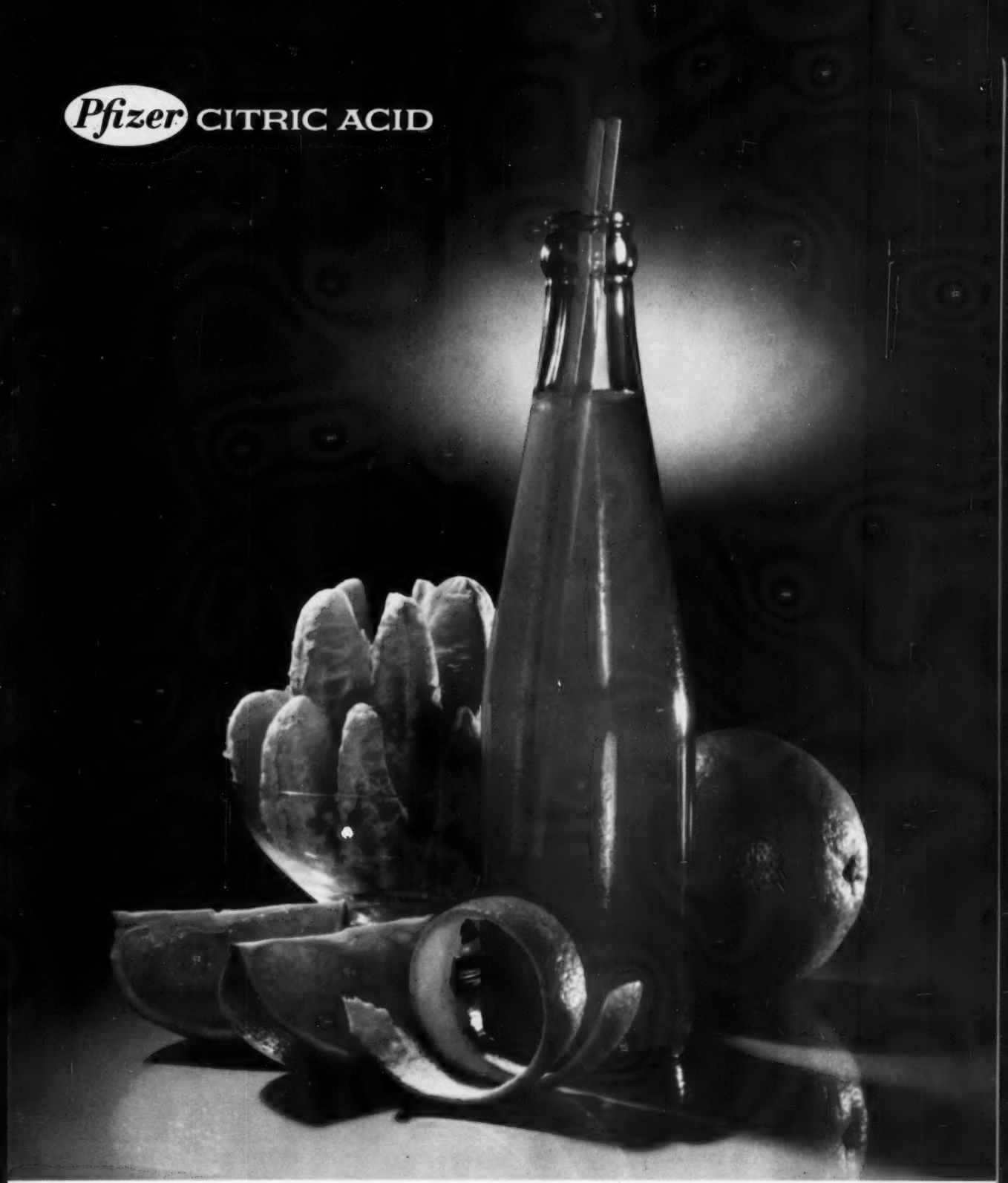
By 1923 the company was convinced that it had really found the formula for producing citric acid of the highest quality on an economical basis. A commercial production plant was put into operation and in 1924 American industry was receiving regular deliveries..

The Pfizer fermentation process proved so efficient that by 1939 the price of citric acid had been reduced to ⅙ the pre-World War I price!

The American food industry was thus assured a readily available supply of economical citric acid from a dependable domestic source.

In addition, by enlisting the assistance of the Pfizer Technical Service staff, customers have shared in Pfizer's extensive knowledge of citric acid and effected sizeable time and money savings in product development and improvement.

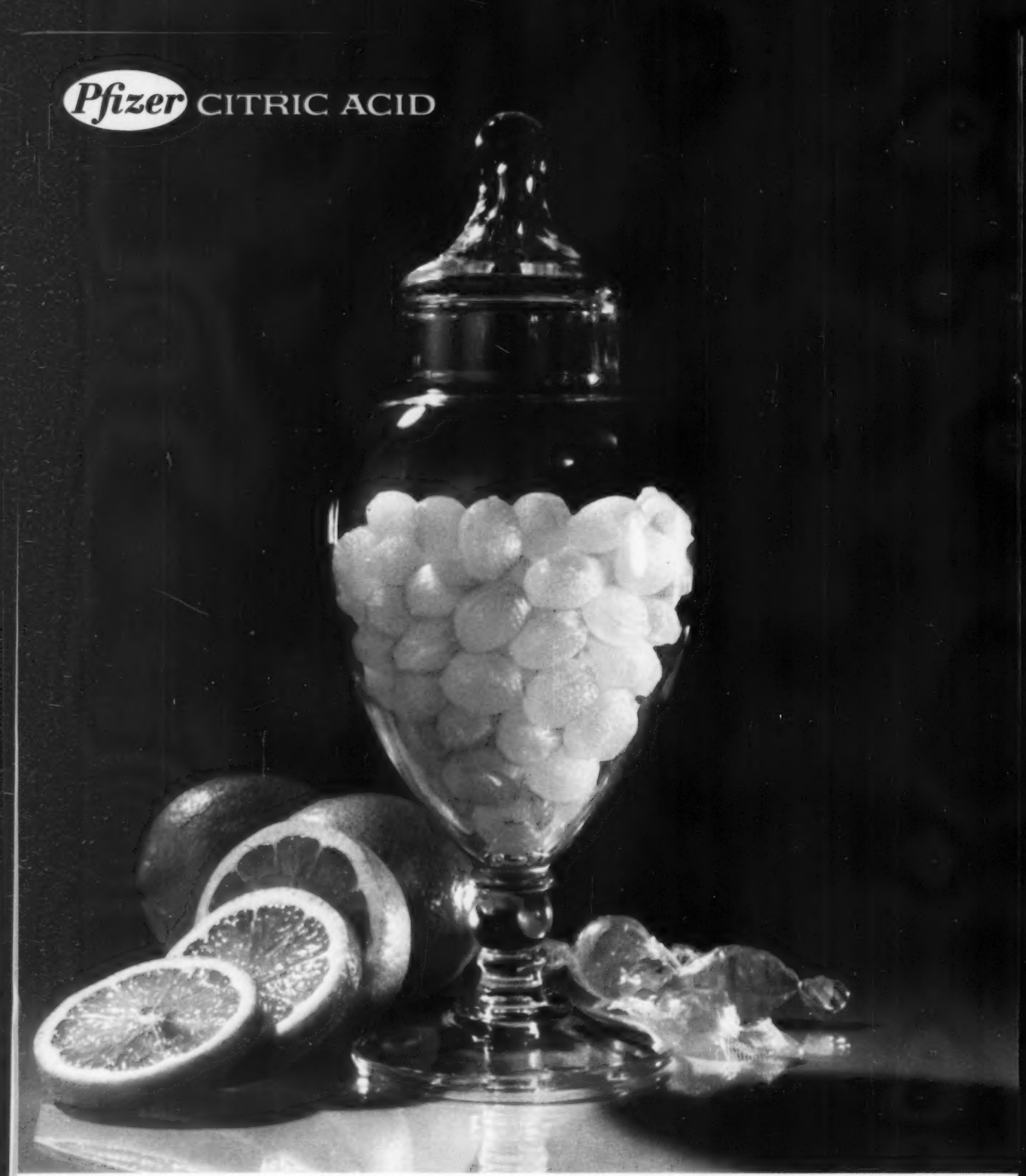
You will see on the pages that follow some of the products in which this versatile acidulant serves as a key ingredient—ample evidence of the importance of citric acid in today's food industry!



Nature's Acidulant

TRADITIONALLY BEST FOR SOFT DRINKS

Citric acid gives soft drinks an authentic, natural tanginess!



Nature's Acidulant

TRADITIONALLY BEST FOR CANDIES

Citric acid is the acidulant you'll use with absolute confidence!

Pfizer CITRIC ACID

Nature's Acidulant

TRADITIONALLY BEST FOR FRUIT-FLAVORED DESSERTS

Citric acid gives fruit-flavored desserts that natural tartness!

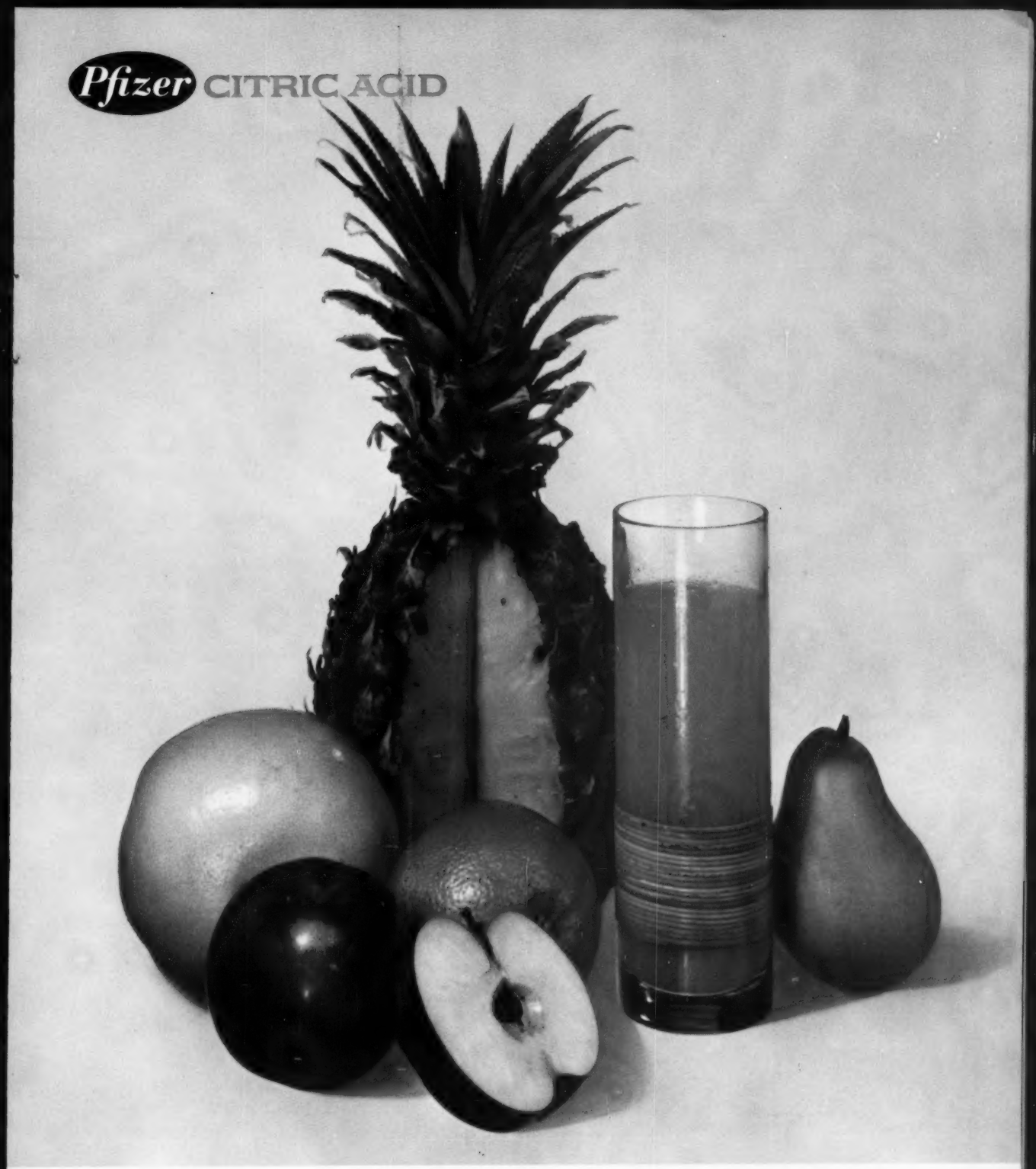
Pfizer CITRIC ACID

Nature's Acidulant

TRADITIONALLY BEST FOR ICES AND SHERBETS

Citric acid's flavor-benefit is that "little extra" so important to true fruit taste!

Pfizer CITRIC ACID



Nature's Acidulant

TRADITIONALLY BEST FOR CANNED FRUIT JUICE BLENDS

Citric acid gives a natural "lift" to real-fruit flavors!

Nature's Acidulant

TRADITIONALLY BEST FOR FRUIT PRESERVES

Citric acid helps bring out the tart-sweet goodness of fresh fruit!

Pfizer CITRIC ACID

Nature's Acidulant

TRADITIONALLY BEST FOR BEVERAGE POWDERS

Citric acid adds the tanginess that contributes to full, rich flavor!

Pfizer CITRIC ACID

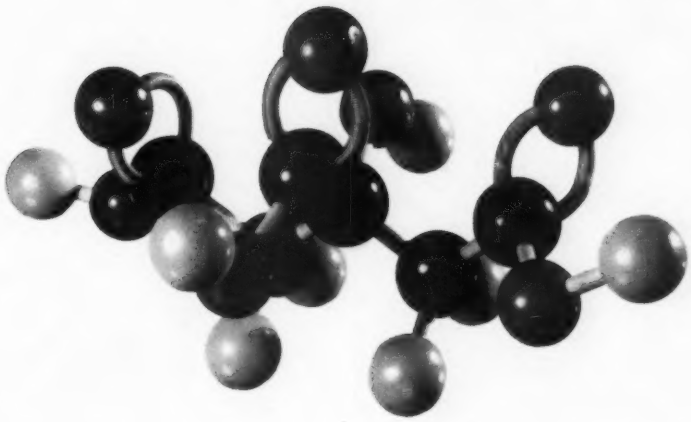
WHERE YOU MAY BE USING CITRIC ACID TOMORROW

In the future, uses for citric acid will extend beyond the area of fruit-flavored products. One area where citric acid may soon prove important is vegetables, particularly canned vegetables.

Small amounts of citric acid help control the pH level in canned tomatoes, beans, carrots and asparagus. Experiments in canned, whole tomatoes indicate that by controlling the pH with citric acid it may be possible to reduce processing time and/or temperature, resulting in a firmer whole tomato.

It has also been shown that citric acid sequesters trace metal contaminants in the pack, thus contributing to the quality of canned vegetables.

Pfizer, world's leading producer of citric acid, will continue to keep you informed on valuable new developments concerning citric acid—nature's acidulant.



Pfizer

CITRIC ACID

TECHNICAL INFORMATION

Pfizer offers citric acid in two basic forms—anhydrous and hydrous

CITRIC ACID, U.S.P., ANHYDROUS

This is produced as colorless, translucent crystals or as a pure white powder. It is odorless and has an acid taste. The compound is stable in the presence of light and air and resists caking under normal storage conditions. Because there is no water of crystallization present, anhydrous citric acid is particularly economical. Its reduced bulk leads to lower costs for handling, shipping, and storage. Furthermore, the lack of water of crystallization assures you of a uniform product and permits exact quality control.

CITRIC ACID, U.S.P., HYDROUS

This form of citric acid has been available for many, many years and is still counted on as a high quality acidulant for a wide variety of products. In physical appearance, taste and odor, it is similar to the anhydrous compound. However, it contains 1 mol water of crystallization (8.58% moisture). Stable in the presence of light and air, it will tend to lose water at high temperatures or in a dry atmosphere.

Various salts and esters of citric acid also find widespread application in the food industry. Two of the more prominent, sodium citrate and Citroflex® A-4, are described below.

SODIUM CITRATE

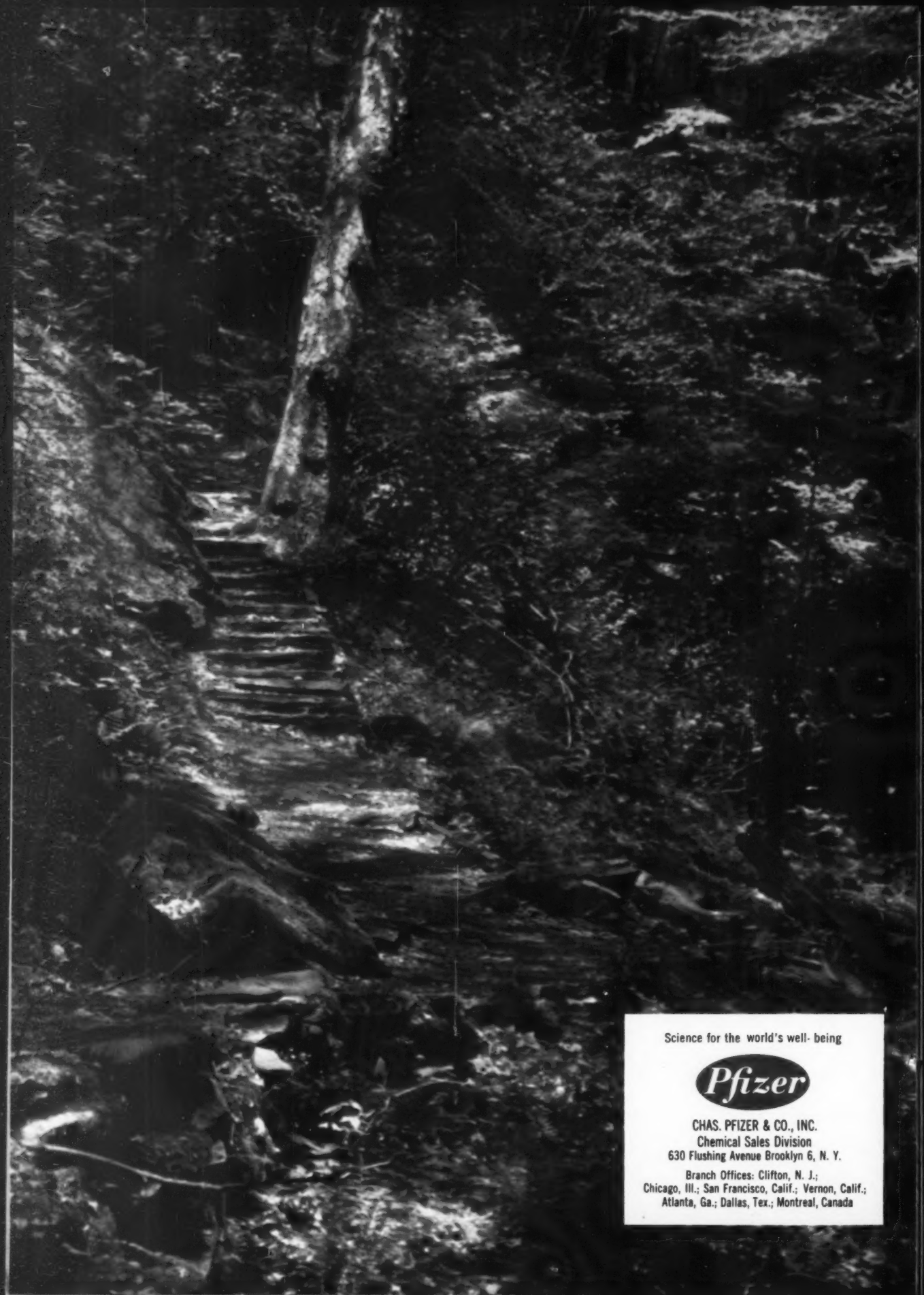
This sodium salt of citric acid is a versatile, easily assimilated product that has many uses in the food industry. Used as an emulsifier in cheese products, it produces smooth, even melting cheese that slices and spreads easily. Similarly, it improves the texture of ice cream. Pfizer Sodium Citrate acts as a buffer salt to control the pH in jellies, preserves, dessert powders, and canned fruit juice blends. And like citric acid, it also brings out true fruit flavor.

CITROFLEX® A-4 PLASTICIZER

Non-toxic, odorless, Pfizer Citroflex A-4 has been accepted by the Food & Drug Administration for use in packaging for both fatty and non-fatty foods. Citroflex A-4 (Acetyl Tributyl Citrate) shows excellent results in plasticized vinyl films for meat wrapping, vinyl coating for food containers and hot drink cups, and vinyl plasticizers for food jar liners and sealing rings. In addition, Pfizer Citroflex A-4 is excellent in polyvinyl acetate adhesives. Low in cost and high in performance Pfizer Citroflex A-4 is finding wide use in plastic coatings for the food industry.

PHYSICAL PROPERTIES OF PFIZER CITRIC ACID

	Anhydrous	Hydrous
Formula	$C_6H_8O_7$	$C_6H_8O_7 \cdot H_2O$
Molecular Wt.	192.12	210.14
Density	1.67	1.54
Melting Point	153°C	Loses water
Solubility, 25°C		
Water	161.8 gm./100 ml.	208.6 gm./100 ml.
Alcohol	59.1 gm./100 ml.	90.4 gm./100 ml.
Ether	0.75 gm./100 ml.	1.6 gm./100 ml.



Science for the world's well-being

Pfizer

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Washington Report

Clarify additives law . . . New food probe readied . . . Delay on antioxidants

Love That Consumer

New Frontier is going all-out for consumers. And part of this concern is inevitably going to come out of the hides of manufacturers.

President Kennedy appointed Persia Campbell, of New York, to head up new White House-based "Office of Consumer Counsel." She'll encourage homemakers to demand lower prices and better quality. In addition, Agriculture Secy. Freeman is setting up a new office to keep a sharp eye on grading, inspection, and regulation of food processors.

On Capitol Hill, Sen. Kefauver wants a new "Department of Consumers," Sen. Neuberger a "Select Committee on Consumer Interests."

Consumer prices will be an important target. President is making it clear that he intends to use all the moral suasion at his command.

Hassle Over Antioxidant Terms

Bakers and other processors will have to wait before FDA decides how fat preservatives and fat antioxidants are to be worded on labels and wrappers.

Bakers balk at having to print "to retard rancidity" on wrappers and labels. They're willing to use terms such as "shortening preservative added" or "shortened antioxidant added" but boggle at adding "to retard rancidity." **Law requires only that substances be identified, industry men point out; there's nothing to require rationalization or explanation.**

Help for Hungry Starts

Food stamps begin to circulate in June. They're the first issued by Washington in more than 20 years. Who gets them? The basis is need—those with no income get stamps free; those with some income pay part of the cost. **Processors aren't involved directly unless they operate retail outlets.**

How it works: USDA distributes stamps ($1 and 25¢ denominations, size of dollar bill) to local authorities, who sell or give them to needy families. They're redeemable at retail outlets for any food items except alcohol, tobacco, fishery products, and foods selling at more than 90% of parity.

Another Food Probe Shapes Up

Senators crank up for a new attack on the food industry. Sen. Hart, man in charge, says hearings won't start before late June, may run into July and August. Food is not the only commodity to be investigated, but it's high on the list—with plenty of consumer-appeal. **Subject matter will include manufacturing methods, advertising, packaging and pricing.**

Probe may be a far-ranging one. For example, Hart criticizes such claims as "Brand Q in the 'giant half quart' size is 10% better."

He makes it clear that the 10% moisture now allowed in hams is due for attack ("Water should not be sold by the pound at the price customarily charged for ham.") And, he asks, is it fair to repackage and relabel a product so as to suggest a reduction from the old price, when actually it's a higher price?

Food Chemicals: International Issue?

U. S. has no present plans to work with Canadians toward uniformity of additives and tolerance levels. A Canadian official said recently that such differences are a barrier to trade, will become more critical in the future. Subject is brought up informally from time to time, but so far nobody has begun action to iron out the differences.

What Additives Extension Allows

Previously granted or pending additives extensions will be continued until July 1, Comm. Larrick declared. While the new law specifies a final cut-off date of June 30, 1964, he said, it does not automatially grant further extensions.

Requests for extensions beyond the July 1 date must: (1) Specify name or chemical designation of the substance, uses, and amount and purpose involved; and (2) outline steps taken to determine applicability of the law and estimates of amount of research work needed.

Further extensions beyond next Jan. 1, will be conditioned upon progress reports made every six months, Larrick said.

FDA doesn't offer much hope of speeding up its study of 3,000 additives submitted by industry for clearance. **It's not possible to group many additives together for blanket approvals, FDA says, because it's the use—not the product—that has to be approved.** Only a limited amount of grouping is therefore possible, FDA insists.

Wage Bill Studied by Conferees

New Federal wage law was in the hands in Senate-House conferees in late April. Because of the wide dissimilarity between Senate and House versions, the task before the conferees was not an easy one.

Canners—on the basis of both bills—can continue to count on their 28-weeks-a-year exemption. Since this provision was agreed to by both houses, conferees are not expected to trim the exempt period during the horse-trading.

(Turn page)

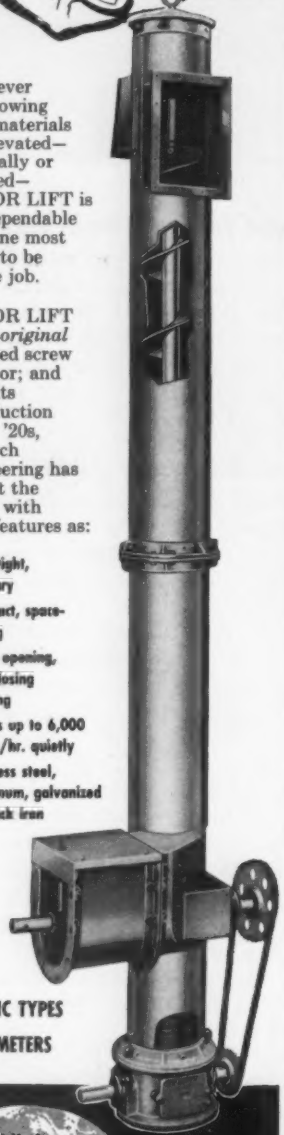
Rotor Lift

-GOOD RIGHT HAND OF THE PROCESS INDUSTRIES!

Wherever free-flowing bulk materials are elevated—vertically or inclined—ROTOR LIFT is the dependable machine most likely to be on the job.

ROTOR LIFT is the *original* enclosed screw elevator; and since its introduction in the '20s, research engineering has kept it the *finest*, with such features as:

- Dust-tight, sanitary
- Compact, space-saving
- Quick opening, fast closing housing
- Moves up to 6,000 cu. ft./hr. quietly
- Stainless steel, aluminum, galvanized or black iron



8 BASIC TYPES

4 DIAMETERS

World's Largest Manufacturer of Vertical Helicoid Screw Elevators

Write for ENGINEERING CATALOG

SOUTHWESTERN SUPPLY and MACHINE WORKS

OKLAHOMA CITY, OKLAHOMA

Washington Report *(Continued)*

Frozen Raw Breaded Shrimp has been sighted for standards revision to include not less than 50% by weight of shrimp material. Nat'l Fisheries Institute and Nat'l Shrimp Breaders Assn. jointly filed proposal to FDA.

Frozen Desserts, including ice cream, ice milk, french ice cream, and fruit sherbets, have received standards revision to include mono- and diglycerides as permissible ingredients.

Sunkist Growers has sought help of Secy. of Agriculture Freeman to protect American lemon growers from destructive imports of concentrated lemon juice under Section 22 application for import relief. SG also asked that lemons be included in USDA's food distribution program.

Dr. Kenneth L. Milstead, director of FDA's Regulatory Management Div., reaffirmed FDA's policy against food product claims for reducing cholesterol in blood and preventing heart disease. His speech before Atlantic Fisheries' technological conference was first official announcement of FDA policy since American Heart Assn. claim in December.

Proposed amendments to the Humane Slaughter Act, redefines the special requirements for the use of firearms as a humane method of slaughtering and handling livestock. It relieves restrictions by permitting the use of small bore firearms for additional types of animals under the act.

President Kennedy has recommended over $23 million increase in Commerce Dept's '62 budget for oceanography. Fisheries are part of proposed program geared to development of natural resources in seas around us.

Expanded Uses for Honey in food and pharmaceuticals may result from recent USDA research conducted by Dr. Jonathan W. White, Jr., and Dr. C. O. Willits. Product is presently under price support.

Strong Industry Interest in, and support of, amendments to cottage cheese standards has spurred committee exploratory contacts with FDA. Proposals provide for stabilizers, acidification of creaming mixture, and addition of nonfat milk solids and salt to creaming mixture.

FDA-Industry Battle continues over controversial orange juice concentrates. FDA witnesses oppose industry proposal that frozen, stored, and thawed juice mixed with other single-strength juice, be noted on label. FDA claims that this produces "little effect," but new heat treatment practice should be denoted on label, although "pasteurized" may not be the only term that can be used.

FE's Box Score on Key Legislation

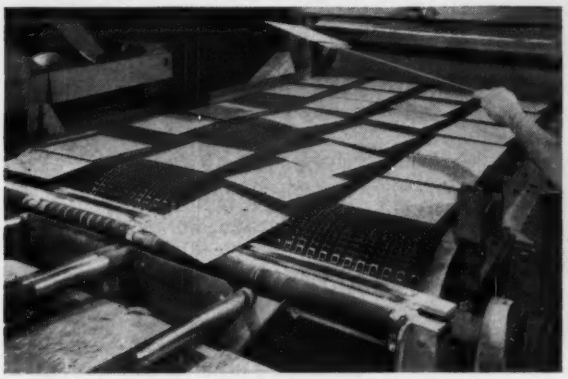
BILL	SPONSOR	OBJECTIVE	COMMITTEE
HR 490	Machrowicz	Put imported bread on dutiable list at 30% rate, same as biscuits and crackers. (Similar to HR 3985.)	Ways & Means
HR 6202	McIntire		
HR 5979	King	Repeal 3¢/lb. processing tax on coconut oil. (Same as HR 5260.)	Ways & Means
HR 6011	King	Establish commission to investigate food chemicals' effect on public health.	Commerce
HR 6126	Breeding	Extend veterans and armed services dairy program.	Agriculture
HR 6192	Hagen		
HR 6168	Boggs	Impose 35% duty on processed shrimp; provide duty free entry of unprocessed shrimp annually if not exceed consumption level of 1960; have Interior Dept. allocate duty free product among origin countries. (Same as HR 657.)	Ways & Means
HR 6212	Willis		
HR 6294	Facell		
HR 6424	Rivers		
HR 6191	Hagen	Extend and increase special milk program for children.	Agriculture
HR 6209	Thomson	Allocate $10 million added funds for National School Lunch Act.	Labor Agriculture
HR 6253	Hagen	Allow USDA set quality standards for grapes, plums.	
HR 6130	Johnson	Establish fund for advancement of commercial fisheries.	Merchant Marine
HR 6252	Garmatz		
HR 6258	Multer		
S 1389	McCarthy	Put turkeys and turkey products under marketing orders.	Agriculture
S 1462	Engle	Same as HR 6253 (above).	Commerce
S 1571	Long	Same as HR6168 (above).	

BILL	SPONSOR	ACTION TAKEN	STATUS
HR 3738	Cooley	Extend Sugar Act.	Passed by both Houses, extends Act to June 30, '62.

Want more efficiency?

California Vegetable Concentrates, Inc., Modesto, Calif., got it with a belt-trough dryer using a USS Cyclone Conveyor Belt that dries their diced vegetables 84% faster than conventional tray dryers. The drying process* is more uniform, and eliminates loading and unloading of individual trays.

*Process designed by Dr. Ed Low, Western Regional Research Laboratory, United States Department of Agriculture. Dryer manufactured by Diamond Manufacturing Co., San Leandro, Calif.



Want to save time and money?

Johns-Manville Products Corp., Waukegan, Ill., used to have trouble aligning their floor tile for an accurate count. Now a Cyclone Conveyor Belt keeps the tiles squarely in line as it guides them to the counter. The time saved by the belt adds up to a sizable cut in costs.

Want uniform production every day?

Warner Dog Food Co., Inc., Brooklyn, N. Y., reduced downtime when they switched to a USS Cyclone Belt. Previous belt breakdowns meant costly delays because of the hours it took to cool and re-heat the bake ovens.

USS and Cyclone are registered trademarks

USS Cyclone Conveyor Belts will work wonders in your plant, too. Whatever your product, a Cyclone Belt will move it faster for less money. Cyclone makes more types of metal conveyor belts than anybody else in the industry. One of our sales engineers will be glad to drop around and tell you which of our basic belt types fit your needs. Send the coupon for your free booklet describing USS Cyclone Conveyor Belts in detail.

For strength, service, dependability.

American Steel & Wire, Dept. 1133
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Please send me your free booklet on USS Cyclone Conveyor Belts.

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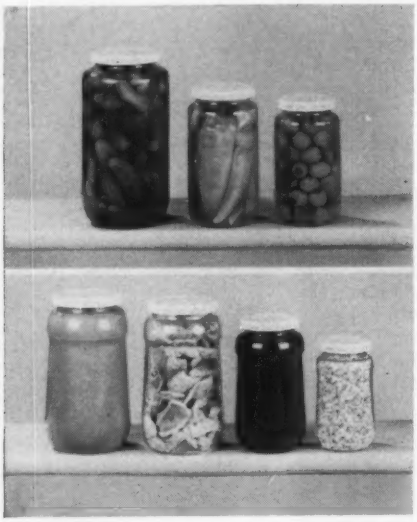
Cyclone Sales Offices Coast to Coast

new packages & products

ATTRACTIVE SIX-PACK DESIGN



LIGHTWEIGHT JAR LINES

MEAT STICKS FOR BABIES

CHOW MEIN 'POUCHES'

SIX-PACK PROVIDES IN-STORE DISPLAY

New design for Miller High Life six-packs provides its own attractive in-store display.

Because one side of each package is opposite from the other side's design, a limitless number of display arrangements can be created. For instance, the white background behind the Miller trademark can be joined to create a "barrel effect" throughout a mass display.

OFFER TWO LINES OF LIGHTWEIGHT JARS

Introduction of lighter weight and lower priced glass jar lines is announced by Hazel-Atlas Glass Div. of Continental Can Co. (311).

"Topp Line" for products from popcorn to preserves is available in eight different sizes and achieves a "noticeable reduction in weight and a savings for packers." Bulb-shape near mouth permits easy spooning of viscous products.

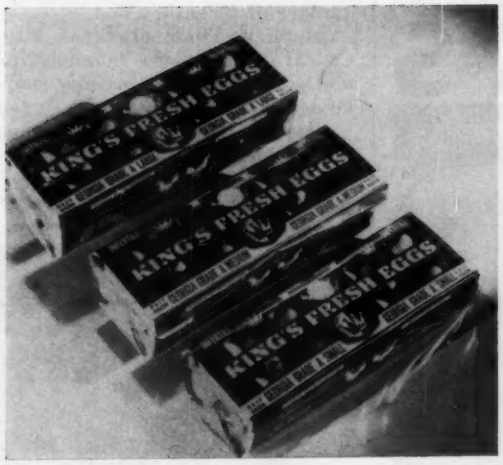
"Lite Line" jars in 8, 12, 16, 22 and 32-oz. sizes are produced almost exclusively for packaging pickles and weigh "considerably less than containers used in the past."

MEAT STICKS FOR TODDLERS

An exclusive "finger food" for babies will be introduced in Western markets by Gerber Products Co.

Made from selected Armour cuts, Gerber's Meat Sticks combine lean pork, beef, nonfat dry milk, and mild seasoning. Easy-to-hold product encourages self-feeding by toddlers and satisfies nutritional needs at the same time.

Meat Sticks are packed in same size can as strained meats, 7 to



EGGS IN CELLOPHANE

IDAHO SLICED POTATOES

the can, and are line-priced with Gerber strained and junior meats.

TWIN-POUCH FOR CHOW MEIN MIX

A polyethylene-lined, foil twin-pouch is being used for "Rogers Chop Suey and Chow Mein Mix" being introduced in the Minneapolis-St. Paul area by Rogers Chow Mein Co.

One pouch contains a blend of powdered seasonings and the other holds the liquid cooking sauces. Housewife need only add fried meat, water and vegetables.

FILM WRAP SPARKS EGG CARTON SALES

"Customers are willing to pay for the extra protection," according to Ed King, owner of King's Poultry & Egg Farm which is marketing egg cartons wrapped in cellophane.

Overwrapped cartons, an increasingly popular innovation in egg packaging, are claimed to stimulate sales and provide exceptional moistureproof properties.

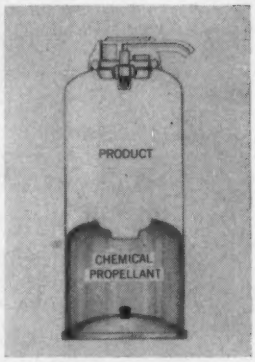
Wrapping machine is made by Hayssen Mfg. Co. (312) and cellophane used is MST-44 supplied by Pkg. Div. of Olin Mathieson Chemical Corp. (313).

SLICED POTATOES FOR INSTITUTIONAL MARKET

Trio Idaho Russet Sliced Potatoes are being introduced to the institutional trade this month at the National Restaurant Assn. Show in Chicago.

Carnation Co.'s companion product to Trio Instant Mashed Potatoes is claimed to offer "consistent quality, fresh flavor and true potato texture. Advantages include maximum convenience and economy, positive cost and quality control, precise portion control and elimination of waste and spoilage."

Each 2¼-lb. package is equivalent to 14-lb. of raw potatoes.



'FREE PISTON' AEROSOL

DEBUT 'FREE PISTON' AEROSOL FOR FOODS

A "free piston" aerosol can from American Can Co. may be the solution to the obstacle of decreasing pressure, a problem common to today's pressurized containers for foods. New can is claimed to eject more than 99% of product.

Plastic piston, or membrane, separates the gas propellent from the product. Propellant pushes the piston higher after each succeeding product discharge. Consistent and uniform pressure keeps product airtight and is believed to be feasible for introducing heavier, viscous food products such as catsup and mayonnaise to aerosol dispensers.

Bradley Sun Div. of American Can Co. is marketing the unique aluminum containers (314).

'HANDY GRIP' MILK BOTTLE

'HANDY GRIP' FEATURE FOR MILK BOTTLES

A half-gallon glass container with pronounced indentations along two sides is claimed to be the "first revolutionary change in

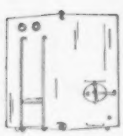
For more data, circle numbers on Inquiry Card, back of book

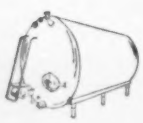
CJ

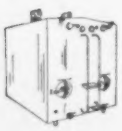
STAINLESS STEEL

TANKS

For . . .
Processing *
Heating
Cooling
Mixing
Surge
Storage







CHESTER-JENSEN builds stainless steel tanks of cylindrical or rectangular design for every purpose — from processing to storage of raw or finished product. Insulated tanks may have pressure-wall sections for cooling or heating . . . rectangular tanks may be of multi-compartment design . . . either may be equipped for vertical, horizontal or air agitation. Cylindrical units designed for processing under vacuum, pressure or atmospheric conditions are available.

All Chester-Jensen Tanks may be of sanitary type, and each is fabricated to serve its purpose for as long as the stainless steel itself may endure. *Your inquiry is invited.*

* Tanks above process a product under vacuum and with required agitation at temperatures to 190° F., and cool to 76°-78°. Product attains desirably high viscosity, which is preserved by forcing it from tank by air pressure.

Chester-Jensen Equipment Is Built Entirely In U.S.A.
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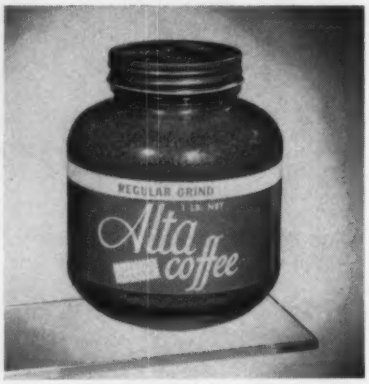
INCORPORATED

BUILDERS OF AMERICA'S FIRST PLATE HEAT EXCHANGER

CIRCLE 36 ON INQUIRY CARD

the design of the economy or family-size milk bottle in almost a quarter of a century."

Supplier, Thatcher Glass Mfg. Co. **(315)**, reports the "handy grip" bottle is being successfully marketed on the West Coast by Arden Farms Co., Los Angeles, and molds are already under construction "for most of the leading dairies."



ALTA COFFEE, product of Alexander Balart Co., San Francisco, is now being packed in 1-lb. glass jars. Jar, with a screw-top closure and a wide-mouth opening for easy product removal, can be re-used for storing and home-canning. Jars are supplied by Owens-Illinois Co. **(316)** and closures by Crown Cork & Seal Co. **(317).**

New Product Shorts

Liquid Crisco will get a market test in the Denver area before moving in nationally against Wesson, Mazola and Kraft, reports Procter & Gamble.

Frozen Plantation Bread, retailing at 35¢ per loaf, is at test market stage in Orlando, Fla., under Morton Frozen Foods banner.

Forti-cal Diet Salad, from Foremost Dairies, and Sego Liquid Diet Food, from Pet Milk, are latest entries into calorie-conscious market.

Packaging Briefs

MSFC Tango and Amber colored cellophane films from Du Pont have received FDA approval. **(322)**

MPE 706X, new poly film resin from Monsanto Chemical Co., is claimed to have "40% greater impact strength than general purpose resins." **(318)**

Inexpensive "thermos bottle" has been created by Stone Container Corp. as a consumer premium package for dietary supplements. An 8-oz. plastic bottle in a "Stay-Cold" foil-lined carton, "thermos" is durable enough to be re-used indefinitely. **(320)**

CIRCLE 37 ON INQUIRY CARD →

Hershey keeps promise of good taste with a special Riegel inner wrap

A special Riegel glassine helps Hershey bars keep that clean look and appetizing taste.

Always good, always fresh . . . that's the success story of the Hershey bar. One reason is the bar's innerwrap of a special Riegel glassine. It protects the chocolate . . . and its crisp whiteness adds to the anticipation of eating pleasure.

Riegel packaging materials are a tradition in candy . . . and in many other industries. Call on us for help in finding just the right paper, film, foil, or combination package, for your product. We've a flair for thinking of it as something special. Write today . . . for the new ideas come from Riegel.

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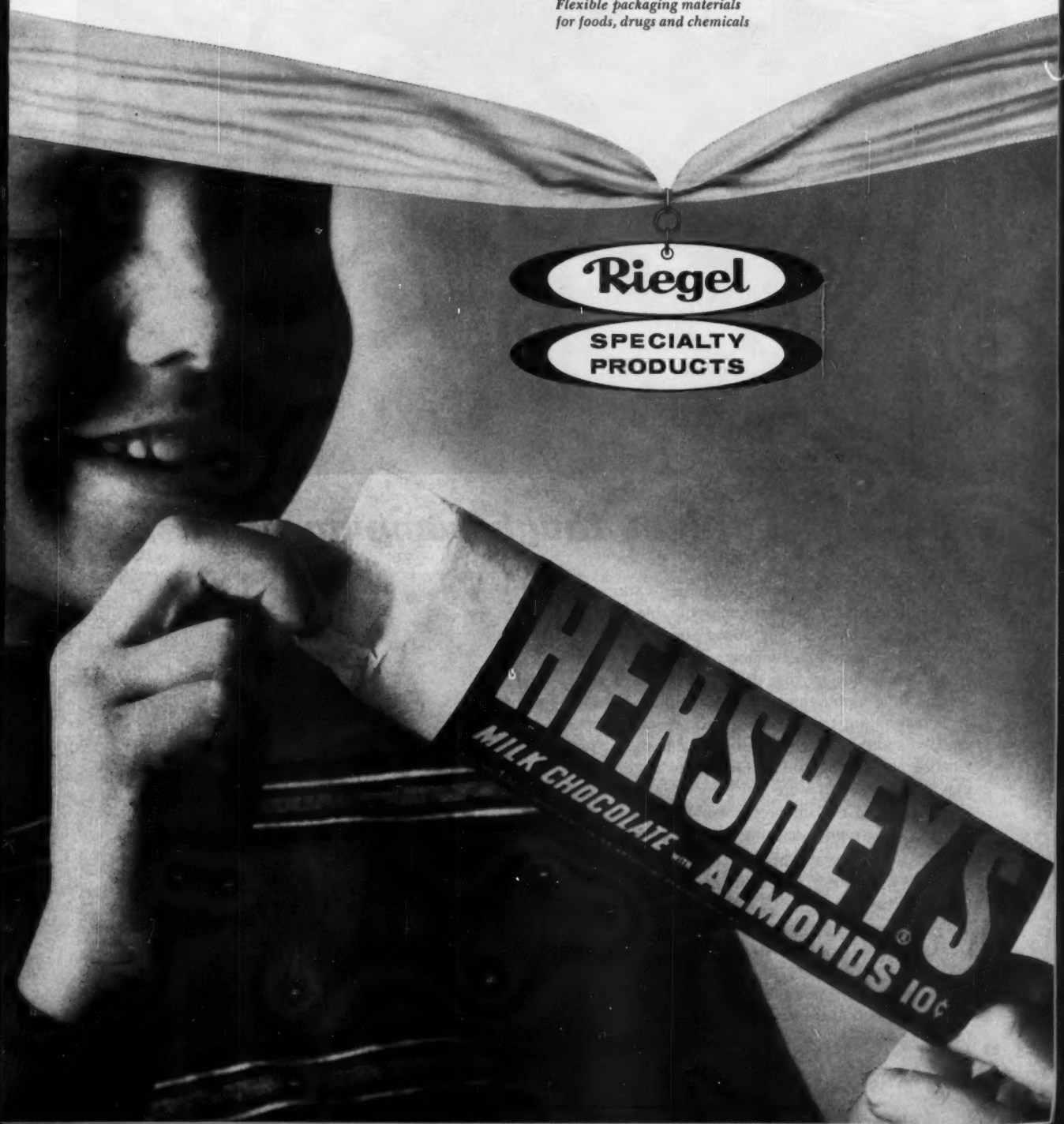
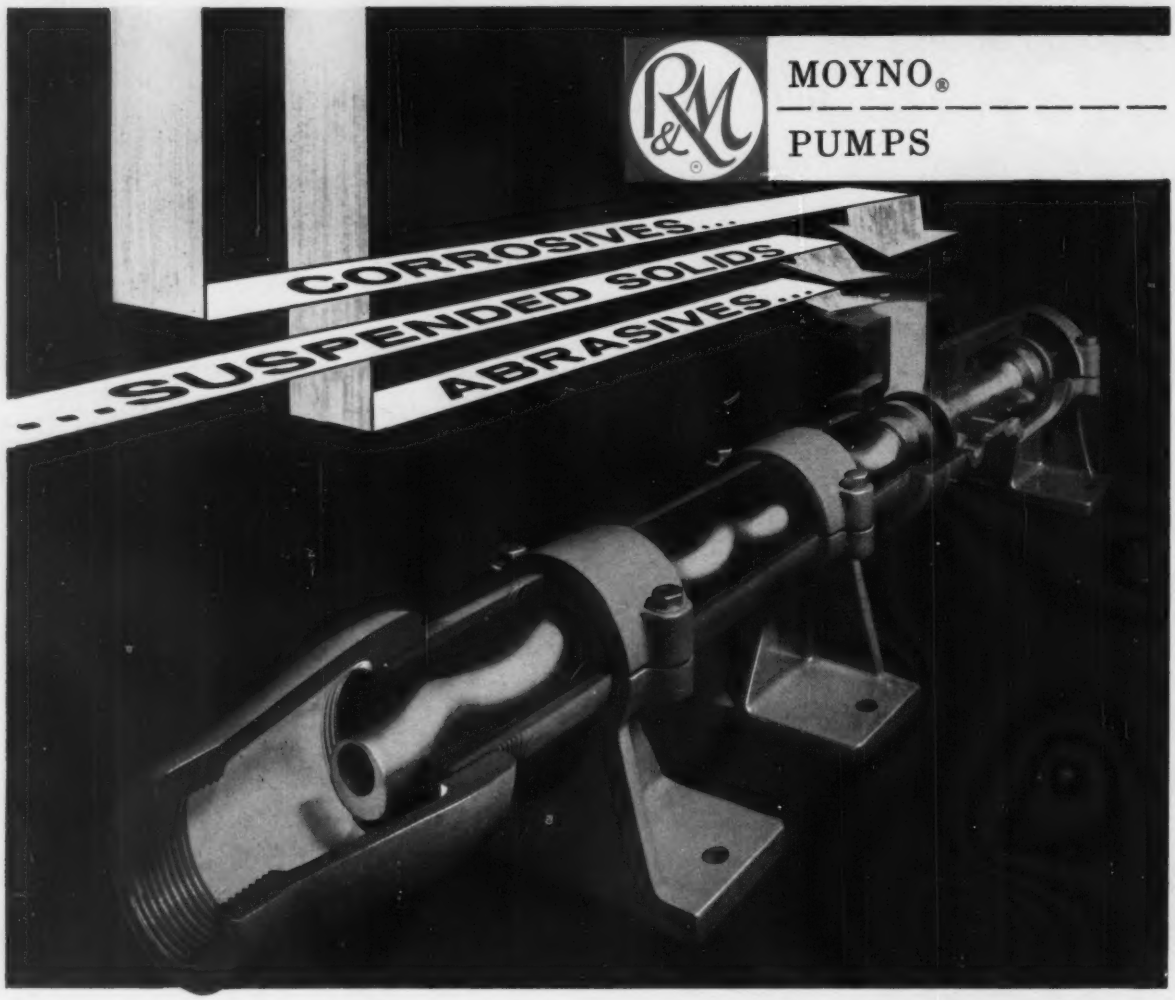
Flexible packaging materials
for foods, drugs and chemicals

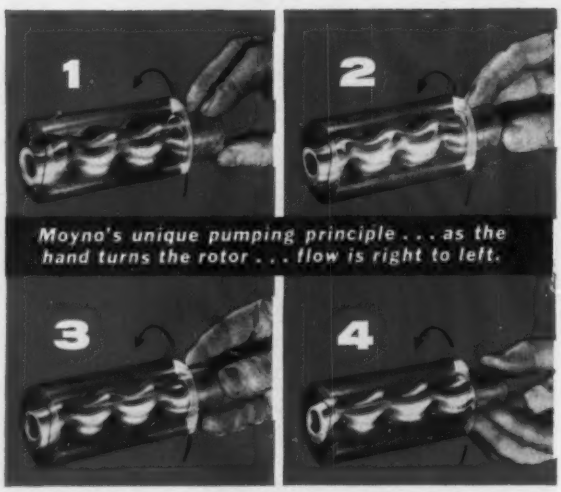




MOYNO® *solves tough pumping problems!*

Moyno's "progressing cavities" successfully handle thin watery slurries, non-pourable abrasives, gnawing corrosives or suspended solids up to 1⅛" dia.—without crushing, foaming or aerating! Material contacts only one moving part, a screw-like rotor revolving in a double-threaded stator. Where corrosives or abrasives are to be handled, rotor and stator are made of special resistant materials that minimize maintenance and prolong pump life. Many materials now pumped by Moyno were once considered "unpumpable" . . . had run up prohibitive maintenance costs on other type pumps or ruined them completely!

Moyno pumps are available in capacities to 500 gpm; pressures to 1000 psi. Learn more . . . write today for new Bulletin 100-FE!



Moyno's unique pumping principle . . . as the hand turns the rotor . . . flow is right to left.

ROBBINS & MYERS, INC., Springfield, Ohio

Fractional and Integral HP Electric Motors • Electric Hoists and Overhead Traveling Cranes • Moyno® Industrial Pumps
Propellair® Industrial Fans • R & M-Hunter Fans and Electric Heat • Trade-Wind Range Hoods and Ventilators
Subsidiary companies at: Memphis, Tenn., Pico Rivera, Calif., Brantford, Ontario.

Packaging Pointers

Promising new boards . . . GF's special pouch . . . Top echelon seat for packaging

Board Bounces Back

Two significant paperboard developments held unusual significance for food firms last month.

. . . A new type of high barrier board that brought nearer the long-time objective of a wrapperless single-wall construction carton. Made by Potlach Forests, the board is coated with a polyvinylidene chloride emulsion that, reportedly, provides the high barrier protection of Saran-type plastics at modest cost.

. . . An economical high-gloss cast-coated boxboard, available in a variety of pastel colors and in heavier weights, that will be suitable for mass-distributed items. It's the result of a new technique by Interstate Folding Box that makes the board and coats it in one step. Firm is also working on a carton with a compartmented plastic liner for Borden Foods.

Aluminum Sharpens Its Pitch

Price has been the loudest voice in the aluminum vs. tin can debate. And producers of the light metal may engineer new cost savings. That's the meaning behind Alcoa's disclosure that it is considering special facilities for producing can stock. As one official told FE: "To compete with tin plate, we must do everything technically possible to produce can stock at the lowest operating cost. This means rolling at higher speeds, with automation at every level."

Cost outlook? Aluminum men say there'll be no price hike on their can stock except in the same percentage that tin plate prices might rise in the future.

Meanwhile, FE learned that Winter Garden Citrus Products Co-op became the second frozen juice concentrator to take the plunge into making its own aluminum cans (Minute Maid was first). Also, that Pasco Packing has joined H. P. Hood in market testing spiral wound paper foil can (for frozen juice).

'Drink Up and Read'

General Foods is putting a new wrinkle into the marketing side of packaging. To backstop promotion of its new Instant Sanka blend and label, company arranged to have 4-cup samples bound into 10 million copies of *Family Guide* and *TV Guide* magazines.

Extra-strong pre-formed poly/foil/paper pouches were developed to withstand 3,000-lb. tests. Then, a special tire-cord rayon tear-string was chosen for easy opening. To control product bulking, filling units were equipped with mechanical deflators that extracted air and flattened sacks prior to sealing. Controlling the filling machine augers and reducing the flow at expense of running speed also helped. Finally, special packing cases were designed to keep pouches in a horizontal position at all times.

VP-Packaging: New Brass Hat

Rapidly changing developments in materials, machinery, and techniques will force more companies to study the position of "vice president for packaging." So states A. J. Gardner, marketing official of Olin Mathieson Chemical.

He reasons: **"As problems in this area become more complex, companies will realize that only top management can effectively integrate packaging with marketing, production, and research."** Also accelerating this growing awareness, he adds, will be the related revolution in merchandising and distribution patterns of which packaging is a key part.

Rate Containers for Salad, Cooking Oils

A recent poll by Home Makers Guild of America (for Owens-Illinois) finds 60% of those interviewed choosing glass as the preferred container for liquid edible oils. While the qt. bottle was the majority favorite, a significant 49% of the housewives said they'd buy ½- or 1-gal sizes if jug had a handle.

Flexible Container for Retorting

A flexible package (with aluminum foil as one of the components) that withstands 250F. retort temperatures for 15-30 min. without degradation was reported by the Quartermaster Food & Container Institute. Military rations unit has protected foods (including processed fruit items) kept at 100F. for a year. Big stumbling block: faster filler-sealers.

BRIEFS

Beer may be the first item to make a wholesale switch to the new thin, lightweight tins. At least four steel producers now offer the new tinplate—US Steel, Bethlehem, Weirton, and Inland.

Giant 8-10 oz. jars now grab about one-third of instant coffee business, according to Nestlé.

Soft drink cans should show a 50% increase over last year's 812 million units, predicts Continental Can. Suppliers see the tins representing 10% of the soda pop market by '65.

Flexible packages with "more of a bottom" are a special research project of Walter Landor Associates. Also: Kitchen cabinets that permit such containers to be hung or stacked upright. Designer says chief consumer complaint against these packages is their tendency to fall over and spill contents.

Profitable food products "GET-propelled"

Fast-moving food items get their sales speed from satisfied customers who keep coming back for more. Helping processors of fine foods improve flavor and texture has been CLINTON's business since before the invention of the shopping cart. More than 50 years of experience with products from corn is working on your side when you specify CLINTON CORN SYRUP, CORN STARCH, REFINED CORN OIL, LACTIC ACID and CLINTOSE BRAND DEXTROSE.

Technical service always available

CLINTON CORN PROCESSING COMPANY

CLINTON

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Important First—MSU Engineering Conference

It had to be done. And Michigan State University did it.

We refer to a national conference on food engineering sponsored jointly by the department of Food Science and Agricultural Engineering at MSU, April 11-12.

Patterned after the more restricted dairy engineering conferences held annually at MSU, this two-day meeting emphasized the new in engineering and processing techniques. Speakers highlighted practical progress in many basic areas, such as sanitation, materials handling, automation, continuous processing, quality control and packaging.

They added a touch of technical glamour by discussing freeze-drying and immersion freezing in liquid nitrogen.

An engineering executive from a top food company contributed inspiration. He pinpointed practical challenges facing food engineers.

Too little attention paid to engineering

Why be excited about this conference? Simply because too little attention has been paid to engineering at technical meetings in the past.

IFT occasionally has devoted a few papers to engineering at its annual meetings, but this has been a minor part of its program. And the papers scheduled were those offered, not those solicited as most timely and appropriate.

What's perhaps worse, most educational institutions seem to be letting food engineering die by default. 'Tis impossible, they say, to teach the science and the engineering required in a 4-year course. Admittedly this is difficult. But the chemical engineer has been successfully trained for many years. The food engineer is his food industry counterpart.

Conferences of the type to be held annually by MSU can help to fill a great need. They can impart food engineering information, and inspiration, to food scientists and to mechanical or other engineers in food companies.

From freeze-dry to noise—takes engineering

New and better processes must be engineered for progress. Freeze-drying and immersion freezing are examples.

Less exciting, but vital, are future engineering achievements in water conservation, air and stream pollution control and reduction in factory noise level.

Troublesome, but necessary, are process changes that must be engineered to handle and inspect mechanically harvested fruits and tomatoes.

All these were highlighted at MSU. And there were many more.

Let's congratulate MSU. And let's encourage and support more engineering conferences in the future.

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FOOD AND DRINK

vacuum dehydrated foods mean new opportunities, new profits for you

Now, continuous vacuum drying makes possible better dehydrated products. They are instantly soluble even in cold water, and their original fresh qualities are preserved in this rapid, critically controlled temperature, vacuum process. Vacuum dried products are lighter in weight and do not require refrigeration. They can be packaged immediately after drying in glass jars, metal cans, or flexible packets.

Now is the time for you to consider continuous vacuum drying. We will be happy to investigate the application of this process to your product lines. Our "Pilot Plant" facilities will provide you with practical information to accurately predict their commercial potentiality. Write today. Girdler Process Equipment Division, Chemetron Corporation, Louisville 1, Kentucky.

WE ARE PROUD TO ANNOUNCE that we have obtained exclusive world rights to manufacture and market this continuous vacuum dehydrator from the Chain Belt Company of Milwaukee, Wisconsin. These units are today in use producing *instant* coffee, tea, orange and grapefruit juice, banana products and others. Write today for complete information on the VOTATOR Continuous Vacuum Dryer.

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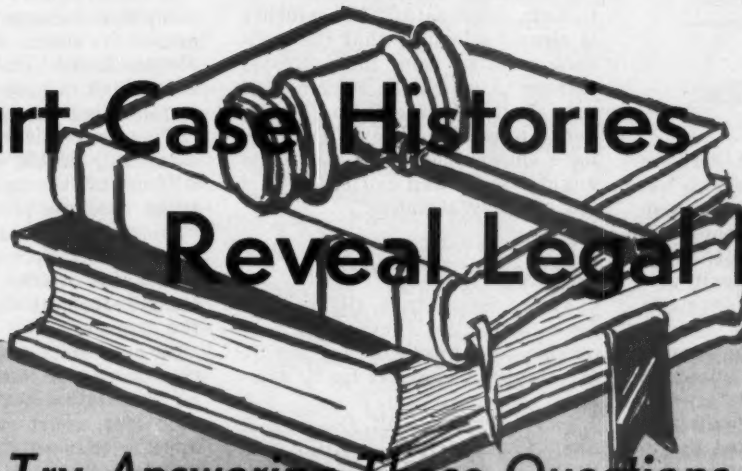
Court Case Histories Reveal Legal Pitfalls



Try Answering These Questions . . .

. . . Then check your reactions with decisions related to each case in the accompanying article of court-case closeups

1. **Who has the burden of proof of negligence in the sale of unfit food?**
2. **Can a packer ever be responsible for injury to a butcher in a retail store?**
3. **Who is liable for damage to food products caused by delay in transit?**
4. **How much care must a warehouseman take to safeguard products in his warehouse?**
5. **Is a label that is not literally true always a case of misbranding?**
6. **Can a company be responsible for his employee's protection from illness?**
7. **Can a retailer be liable along with a packer for disease caused by poorly processed food?**
8. **Does FTC have jurisdiction over processors who have products containing meat ingredients?**

UNAVOIDABLE COURT SUITS are almost inherent to operating a business, be it large or small. And your best method of facing tricky and often expensive litigation is advance preparation.

Herein, we brief several higher court decisions related to the food industry. Knowledge of these precedents can help you through tough legal situations or even keep you out of a court battle altogether.

Court index references are cited as guides for those wishing to make library rundowns on complete information regarding a particular decision.

LEO T. PARKER
Attorney at Law, Cincinnati

1. Must Prove Negligence

By furnishing food to the general public, both a manufacturer and a retailer impliedly warrant that the product is fit for human consumption. And, if the food proves to be deleterious, either or both may be required to respond in damages to an injured consumer. But it's up to the consumer to prove that such food was unfit when sold by the retailer.

For example, in Tiffin v. Atlantic Co. (162 N. E., 2d, 406)—it was shown that dependents of a deceased Tiffin sued both a retailer and processor for heavy damages. Tiffin's death was allegedly caused by eating unwholesome ham which had been purchased from a retailer and processed by a packer.

During the trial, retailer proved that, immediately upon receipt of the hams, several were spot-checked for internal temperature by placing a needle point thermometer into the meat. Six days later, a refrigerated ham was sold to Tiffin. Two more days later, after the ham was cooked and kept in a refrigerator, Tiffin ate some of the ham, became ill, and soon died. Samples of the ham were examined in the state laboratory and the ham was found to contain hemolytic staphylococci, a bacteria commonly associated with food poisoning.

(Turn page)

Testimony showed that there are several types of staphylococci, but only a limited number are hemolytic in nature, and even these are not poisonous in and of themselves. Rather, it is the toxin produced by such growing bacteria that may be poisonous.

Except for sterilization there is no way to completely eliminate this bacteria although its growth, and the accompanying toxin production, may be prevented by refrigeration. Staphylococci remains dormant at temperatures below 50F. As the temperature increased the bacteria works more effectively with the ideal temperature for growth being 85F and 110F. Beyond this point the bacteria again becomes inactive and is killed at a temperature of approximately 150F.

Toxin, however, is not as susceptible to heat. It may be boiled for as much as a half hour and still retain its activity.

Higher court refused to hold either the retailer or processor of the ham liable in damages to Tiffin's dependents. Court felt the testimony did not positively prove that the ham was unfit for human consumption when purchased.

2. Price of Carelessness

A simple rubber band can be a dangerous item. It cost one food processor $2,500 damages for injuries to a butcher's eye.

In Katz v. Swift & Co. (276 Fed., 2d, 905) testimony showed that Katz, a butcher, was struck in the eye by a rubber band which jumped or sprang off the shank of a lamb. Katz sued the processor who sold the lamb to the butcher shop for $2500.

Trial evidence showed that, after slaughter in the meat packing plant, lambs passed along a conveyor belt where the shanks were trussed up to the lamb's body. Employed was a rubber band twisted around the shanks in a figure eight pattern.

Each employee performing this operation was required to bind six lambs per minute. And one of the plant supervisors conceded in his testimony that he had noticed that the rubber bands were sometimes improperly applied.

In holding the processor liable to Katz, court said: "The evidence is clearly adequate that the accident resulted from the improper manner in which the rubber band was applied to the lamb. Defendant (processor) knew or should have known that the rubber band might slip off and cause injury if not securely attached."

3. Carrier to Blame

Very frequently, a slight delay by a carrier in transporting perishable food products may entitle the shipper to recover heavy damages.

Case in point—Gulf, Colorado & Santa Fe Railway Co. v. Hillis (320 S. W., 2d, 687). Facts were as follows: A carload of onions was shipped from Texas on June 5—and arrived in Baltimore, Md., on June 12, seven days later. Ordinarily, transit time should be five days. Further testimony showed that the onions were U. S. Number One grade and in good condition at the time of shipment. On arrival in Baltimore onions were found to be decayed.

Cash market value of the onions in good condition was $1,402.50. But damage caused them to be sold for $452.45.

Higher court held the carrier liable in $950.45 to the shipper, saying: "The onions being shown to have been shipped in good condition and received in worthless condition makes a prima facie case for plaintiff and defendant introduced no testimony to Hillis."

4. Ignorance No Excuse

A higher court has also held that even if a warehouse company is inexperienced in storing certain food products, it is still legally obligated to exercise at least "ordinary" care to safeguard the products against deterioration and damage while in storage.

In Essex v. Redman (271 Fed. Rep., 2d, 885) testimony showed that a warehouseman had no previous experience in storing rice. Nevertheless, he accepted a considerable quantity of rice for storage and issued negotiable warehouse receipts.

During storage the rice deteriorated considerably and holders of the receipts were compelled to sell at very low prices. Receipt holders sued the warehouseman for damages based on the value of the rice when originally stored in the warehouse.

A higher court found from testimony that damage to the rice was caused by heat. Warehouse employees failed to use due care and also failed to provide appropriate warehousing services.

This court held the warehouseman fully liable in damages to holders of the negotiable warehouse receipts, pointing out that: "The measure of damages in this case is the difference between the reasonable market value of the goods before the damage and after the damage."

In answer to assertions that in this particular location there was no "market" value for the deteriorated rice, court said: "Where it appears that no market value for a commodity exists at the place involved, the market value at other places may be shown, if these are sufficiently near to show, in connection with cost of transportation, etc."

5. Case of Semantics

What is the meaning of the word "adulteration" in labeling? It may be just a matter of semantics.

For instance, a higher court recently held that a food product which was labeled "flavor of vanilla, sugar colored," was misbranded even though it contained pure vanilla extract in small quantities.

But in another case a court held that a food product composed of sugar, citric and tartaric acid and the other articles of food, is not misbranded by being named "Grenadine Syrup."

In a third case, the term "cream vanilla," which was used to describe the flavor of a food product comprised of corn starch pudding, was held by a court not to indicate the presence of vanilla in the food. According to the court, use of these words on the label was proper even though vanilla extract is not used in the product's manufacture.

Therefore, it seems that where a name or term has a well-known meaning among the trade, the manufacturer may be permitted to use the term on a label of a product even though, in a sense, it can be misleading to persons who are not familiar with trade terms. This is true, however, only where such terms generally have a well-known meaning among those per-

sons familiar with the particular business and product.

6. Safety Is a Must

It is a well established law that an employee may recover heavy damages if he is injured, or contracts a disease, as a result of his employer's failure to furnish a reasonably safe working place. This rule of law is applicable to any and all conditions of employment.

Here's a pertinent food case—Armour & Co. v. Mitchell (262 Fed., 2d, 580). An employee named Mitchell sued Armour for $12,000 damages, claiming that he contracted bronchitis and lung congestion as a result of the failure of the company to exercise due care in furnishing him a safe place to work.

Testimony showed that Mitchell was employed to bone meat on a table in the cooler room in temperatures of 29 to 38F. Table was close to below-zero freezer room from which air blew on and under Mitchell's feet. He was also required to assist in unloading truck containing cold storage commodities. As a result of constantly passing between the cooler room and the 90° loading platform, he developed the illness.

Jury held Armour & Co. liable to Mitchell in the full $12,000 damages and the higher court approved the verdict.

7. Pork's a Problem

Dual responsibility of supplier and retailer was pointed up by a recent court decision in which both were held liable in damages to a consumer who ate undercooked pork.

Case was Naujoks v. Suhrmann and Jordan Meat and Livestock Co. & Valley Sausage Co. (337 Pac., 2d, 967). Suhrmann is a retailer of meat. The Jordan Meat and Livestock Company & Valley Sausage Company is owned and operated by Guss, who is a meat packer and supplier.

Naujoks, a customer, contracted trichinosis by eating mettwurst sausage originally furnished by the defendant packer and retailed to him by Suhrmann. Naujoks sued the retailer and supplier for heavy damages.

Testimony showed that the packer, Jordan, processed cooked mettwurst, a form of pork sausage. "Cooked" means that the mettwurst has been heated to at least 137F., the minimum temperature necessary to kill trichinae, a tiny organism which causes trichinosis.

It appears that excessive cooking spoils the flavor desired in mettwurst and that Suhrmann was anxious that it not be heated too extensively. Jordan informed Suhrmann that it was impractical to cool down the ovens for just one product. Suhrmann then offered to process or "smoke" the unfinished mettwurst at his own establishment.

Guss, of Jordan, agreed to process the mettwurst as completely as possible without the use of ovens and then deliver it to Suhrmann. Suhrmann, with some advice from Jordan personnel, further processed the mettwurst but failed to cook it to the extent necessary to kill trichinae. Some infested meat was sold to Naujoks and others who contracted trichinosis.

The Supreme Court held that Naujoks could recover damages from the Jordan concern. Court said: "It is conceded that the suppliers knew of the dangers of trichinae in uncooked pork. Inasmuch as Jordan personnel knew that the mettwurst was not being processed to kill trichinae before being sold to the public is imputable to the suppliers. This, coupled with their admitted knowledge of trichinae in uncooked pork, provides a substantial basis in evidence for finding them negligent and imposing liability upon them."

In addition, since Suhrmann had knowledge that the mettwurst he sold was not properly cooked, he also automatically became liable in damages to Naujoks.

8. FTC Jurisdiction

Considerable discussion has arisen over the question: "Is a canner or processor of food products containing meat ingredients under jurisdiction of the Federal Trade Commission?"

A higher court recently answered in the affirmative.

In Crosse & Blackwell Co. v. Federal Trade Commission (262 Fed. 2d, 600), these interesting facts were presented: Crosse & Blackwell is a well-known canner of soups, marmalades, tomato products, pickles, relishes, and other food products. Firm puts up and markets approximately 150 different products under the brand name "Crosse & Blackwell" and another 35 under the brand name "Keiler."

Some 14 products contain meat or meat stock as one of the ingredients. Meat content is derived from cuts which Crosse & Blackwell purchases from slaughter houses and then trims, bones, cuts, mixes and cooks for subsequent mixing with other ingredients.

Because it processes meats, Crosse & Blackwell obtained registration from the Department of Agriculture under the Meat Inspection Act. Daily, Department officials supervise and inspect plant and operations insofar as they relate to meat products.

Crosse & Blackwell was charged by the FTC with violation of the Clayton Act by giving advertising credits to certain retailers but not to other competitors of these retailers.

Crosse & Blackwell lawyers attempted to avoid prosecution by contending that the company is a packer within the meaning of the Packers and Stockyards Act of 1921. Under that definition, exclusive jurisdiction of its trade practices, with respect to all of its products, is lodged with the Secretary of Agriculture. Consequently, it was contended that such jurisdiction has been wholly withdrawn from FTC.

The higher court refused to agree with this contention, saying: "We may start with the assumption that if the only business of Crosse & Blackwell was the preparation and sale of corned beef hash and its other products containing meat, we would agree that its products were meat 'foot products', its business that of a 'packer', and its trade practices subject to regulation under the Packers and Stockyards Act.

"Doubtless, Congress did not anticipate that a canner of miscellaneous food items might avoid compliance with the general antitrust laws solely by reason of the fact that it used a relatively small quantity of meat as an ingredient in some of its products. We conclude that Crosse & Blackwell was subject to the jurisdiction of the FTC . . ." (End)

Boost Packaging Efficiency

Big and small firms give tips on ways to keep costs in line, gear containers to market needs

LOW-COST competitor to today's frozen food wrapped carton are these thermoformed "dishes" made from hi-density poly. DuPont showed these lab models at AMA show. Similar version by Phillips Petroleum tested briefly by General Foods. (399)

HOW TO get more market power while keeping a firm grip on packaging costs. That's the top-level dual-sided aim of budget-minded food company chiefs today. What small- and large-size food firms are doing to achieve just that was spelled out at last month's American Management Assn. national packaging conference in Chicago.

Centralized buying of packaging materials gives Ralston-Purina a tight rein on cereal container costs, according to Frank X. Tully, general purchasing agent. Although company has 5 cereal plants scattered around USA and Canada, all buying of packaging materials is centralized at firm's St. Louis headquarters.

R-P profits two ways from this set-up, Tully feels. First, procedure **enables branch plants to "spend full time on production," which is their responsibility.** (Supplier salesmen, forbidden to call at branches, make their proposals to St. Louis officials.) Secondly, product control and development lab, headquarters-located, interviews all salesmen to keep abreast of trends and changes. Backstopping the department is a packaging-labeling committee, made up of reps from purchasing, sales, advertising, production, and legal units.

Although St. Louis decides what (and how much) is to be bought, branches place the orders, schedule deliveries, and pay the bills. All orders are put on a bid basis, and copies of the offering quotations are sent to the branches. Later, branch plants check the bids against invoices from suppliers to make sure that prices adhere to earlier quotations.

Ceiling on Stocks

Inventory control gets a strong play in R-P's packaging cost program. **Taking a cue from retailers who force grocery manufacturers to stockpile more of their own inventory, R-P tries to keep most of its packaging inventory in suppliers' plants.** Tully later told FE that the company usually works with a 10-day inventory level. Another factor behind this policy: Most R-P plants are pretty old. With space at a premium, company would prefer to devote storage area to finished goods rather than empty containers.

R-P also tries to have two packaging suppliers for each plant, except where the volume is so low that the company would pay a penalty for printing. Elaborating on this to FE, Tully explained that R-P employs a cost-per-thousand base for containers to decide when one or two suppliers are justified. Where possible, company tries to use a supplier near the production plant in order to minimize freight costs.

The purchasing agent stresses the importance of department teamwork and forward planning in the buying of packaging supplies. Thus, at R-P, sales and advertising goals, drawn up before the start of the fiscal year, are reviewed by the buyer so he will know what will be needed by way of containers as far as a year in advance.

Then, too, sales and advertising cue purchasing on upcoming promotion campaigns when special package illustrations or copy will be required. Thus, buyer gets a head start on getting best bid from suppliers for redesigned cereal boxes.

This kind of cooperation will become even more necessary in the future, Tully believes. That's because the package plays a bigger role in strengthening corporate market strategy by acting as a visible in-store reminder to the consumer of the ads he may have seen or heard some time back.

Purchasing department receives monthly reports from branch plants on what was produced, packaging materials that were used up, and remaining on-hand stocks. By matching these against similar reports from sales, as well as the annual goals, department gets a running fix on amount of packaging supplies needed for the next 3-mos. span.

—with Internal Checks . . .

Self-Service Demands

While costs remain paramount, shifts in the food industry's distribution channels have put greater emphasis on food packaging's marketing side. With self-service units steadily increasing their share of food store sales, the package totes a bigger load in generating volume.

Candy-maker Stephen F. Whitman & Sons learned this lesson two years ago when it began to expand from narrow-base gift-type items to supermarket outlets. As Julian T. Barksdale, marketing vice pres., conceded at the AMA session, the kind of package that rates well when "personally sold" by a store clerk doesn't have the built-in generator that sparks fast turnover on competitive supermarket shelves.

As a result of a company study of consumer shopping habits in supermarkets, Barksdale lists these four basic check-points for self-service packaging:

► 1) **Box dimensions** must make carton easy to pick up and handle, as well as strong enough to withstand rough handling.

► 2) **Product identification** should be "a prominent part" of package design. And if you make other related items, corporate image "must be an important part of overall design."

► 3) **Basic design** should carry family resemblance over from package to package to give strong support to each item. This factor becomes even more critical for mass displays.

► 4) **Color, "the most critical stage of all,"** must be appealing and pleasing, yet strong enough to stop the consumer. Whitman gets a simple check on this by making photo transparencies of more than 50 color variations of the same design. Observes Barksdale: "The colors that stand out here are the ones which perform best on retail shelves."

. . . and Improved Materials

Rival container types vie to offer food makers most useful, economical service

ACCELERATED competition between packaging materials continues to give food packers a wide choice of container types. This was evident at AMA's Exhibit last month which highlighted these developments:

. . . **Increased-yield cellophanes:** DuPont and Olin Mathieson unveiled polymer-coated films that provide 25,000 sq. in./lb., or 19% more than previous versions. DuPont stresses that since the price remains the same, greater yield spells a cost reduction for users. DuPont's type is aimed at breadwraps, Olin's for items with high shortening content. Two firms also disclosed that yield of nitrocellulose-coated cellos, for baked goods, was upped 5% to 22,000 sq.in./lb. **(394)**

. . . **Plastic-Paper Combinations:** Dixie Cup introduced what is called "the first polyethylene-lined cup" for food items in 16-oz. and 1-pt. sizes (with 8-oz. unit to come later). Firm cites these 3 benefits: Inner lining and outer coating insure a near perfect moisture-vapor barrier; complete heat-seal, with poly lining taking place of adhesive; 25% less weight than over-waxed unit, resulting in freight savings. **(395)**

Pre-assembled paper carton, with enclosed 2-mil heat-sealable polyester bag (see photo), for frozen foods, was shown by Kapak Products. Designed for heat-in-pouch items, combination unit eliminates separate handling of carton and sack, holds servings of 5 to 7 oz., protects bag from developing flex cracks or pin holes.

Plastic-lined paper box, designed for concentrated liquids and mixes, was displayed by Waldorf Paper Products. Components include polyester-laminated kraft paper which is then formed into box shape and inserted into an outer board container. Top folds are so styled that one end becomes a spout, the other a vent **(397)**

. . . **Plastics:** Oriented polypropylene, considered by many to have a bright future in food packaging once sealing problems are solved, was brought out by AviSun and Visking.

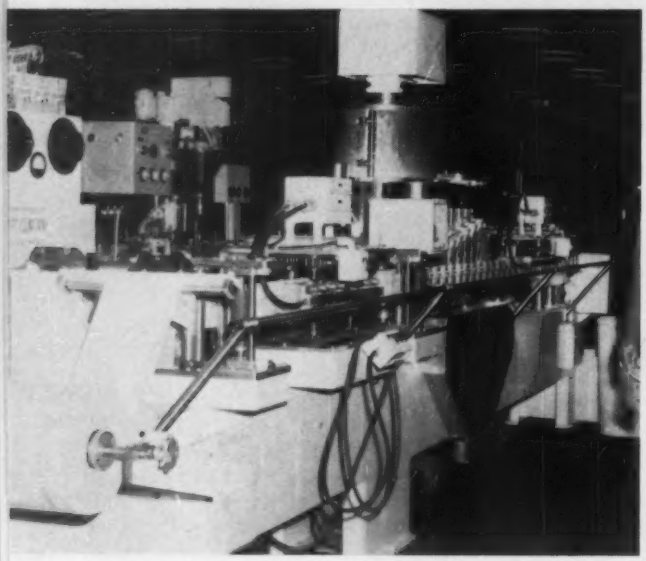
Roll-type, 2-ply Saran, for ground beef, was debuted by Tee-Pak. Company says opaque wrap effectively locks in meat's natural juices, prevents dehydration, withstands rough handling. **(FE Staff)**

PRE-ASSEMBLED plastic-lined carton has wide open top for easy filling. Pouch "separates" from enclosed box during freezer storage, permitting easy removal in the home. **(396)**

Cost-Cutters Stressed at

Efficiency, speed, and quick adjustability highlight equipment shown at

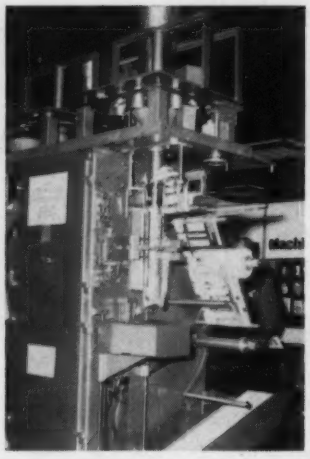
3 Form-Fill-Seal Flexible Packagers

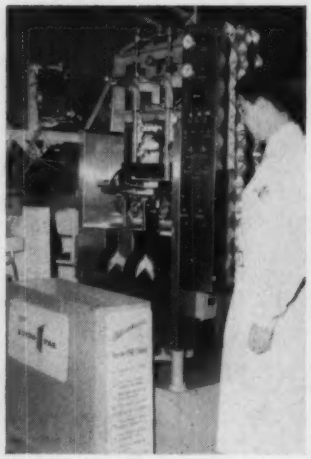


▲ **UP TO 600 POUCHES** per min. are made by continuous motion unit using horizontal flow principle. Single-purpose mechanisms accomplish form-fill-seal operations at separate stations. Strong heat seals assured by "traveling beam" bars that have ½-sec. dwell time.—Bartelt Engineering, Rockford, Ill. **(375)**

VERSATILE POUCH-MAKER is double-tube machine that simultaneously runs two different sizes with two different products by means of two different feeds. Speed: Up to 150/min. — FMC Packaging Machinery Div., Phila. **(376)**

▼

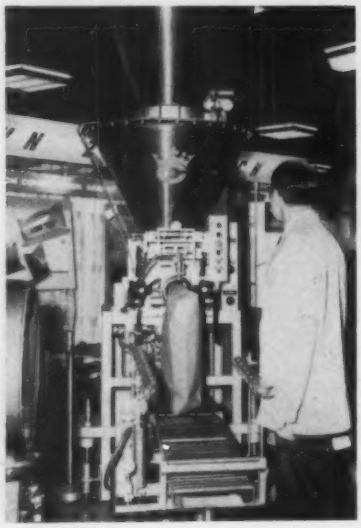




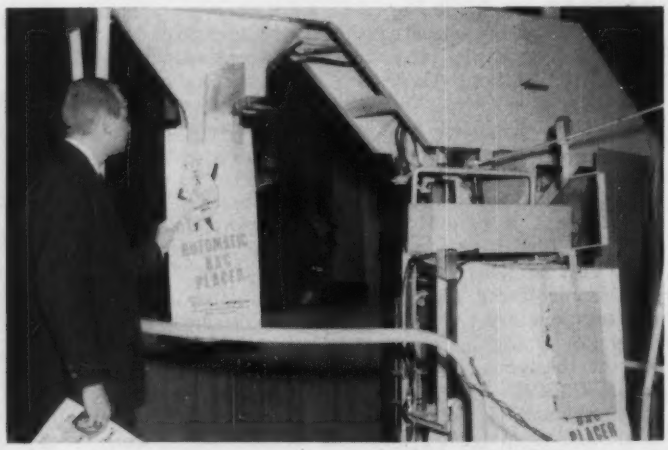
▲

TWIN - HEADER employs roll film for forming-filling, turns out up to 250 tetrahedron - shaped containers per min. Packs powders, liquids, or semi-liquids in single- or multi-unit carded blister packs — Bemis Bros. Bag Co., St. Louis. **(377)**

2 Baggers



◄ **AIR-FLOW PACKER** fills 8 valve-type multiwall shipping bags/min. with finely divided materials, eliminates sewing or taping. Air-operated clamp holds sack on filling spout during pouring cycle.—Crown Zellerbach, San Francisco. **(382)**



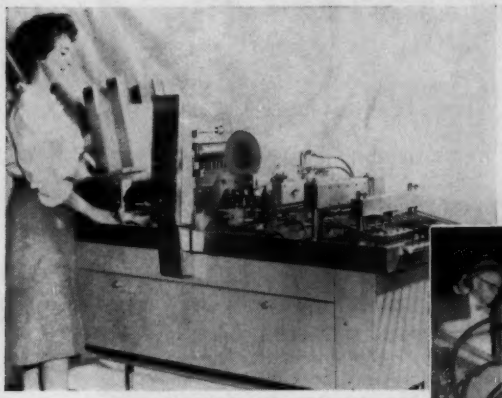
▲

BAG PLACER with predetermining counters and no bag - no product safety device operates at 28/min. speed, holds container on filling spout as picker arm removes another sack from magazine.—Raymond Bag, Middletown, O. **(381)**

AMA Packaging Show

American Management Assn.'s big packaging exposition in Chicago

Filler-Sealer, 2 Wrappers



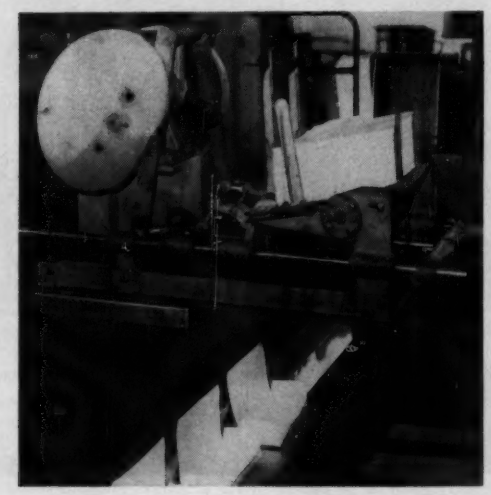
STRETCH PACKAGER, using die-cut cards with vinyl-film window, is equipped with card-carrying plates, pouch-forming press, fold-over mechanism, and sealing press to produce 50 easy-to-display, pilferproof packages per min. — Lynch Corp., Anderson, Ind. **(379)**

MULTI-FUNCTION MACHINE fills liquid or viscous products into magazine-fed sheets of preformed multiple rows of polystyrene cups (½- to 1-oz.) up to 9,000/per hr. rate. Also seals container tops.—Lily-Tulip Cup Corp., N. Y. C. **(378)**

ACCUMULATOR - BUNDLER group-wraps carton-packed ice cream at speeds up to 3,000 per hr. Handles roll-fed paper, plastic film, foil, or laminations. Loading attachment also places cartons of novelty items onto infeed conveyor flights of wrapping machines.—Hayssen Mfg., Sheboygan, Wis. **(380)**

2 Cartoners

SET-UP MACHINE folds magazine-stacked polyethylene-coated board blanks into heatsealed, water-tight cartons. Boxes have poly-to-poly heat sealing of flaps for added corner strength.—Stone & Forsyth, Boston. **(383)**



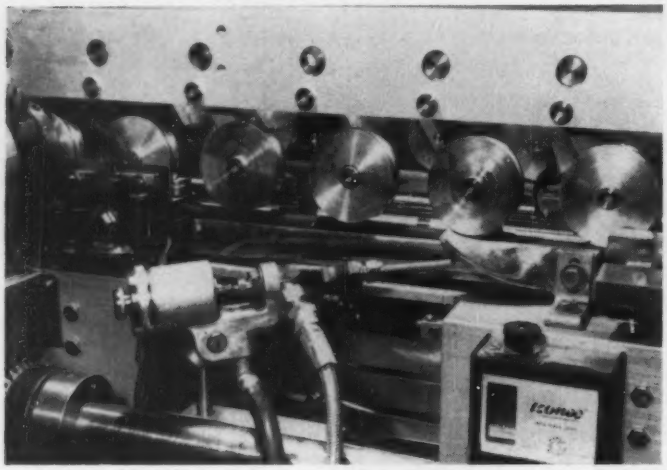
AUTOMATIC loader and packager for ice cream novelties (speeds up to 50/min.) requires only one person. Changeover for different size cartons takes only 5 min.—Integral Packaging Systems, Chicago. **(384)**

For more data, circle item number on Inquiry Card, back of book

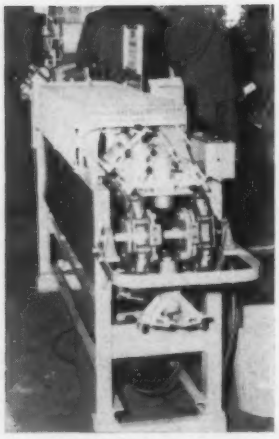
Cost Cutters Stressed at . . .

4 Sealers

GLUE-SAVER, operating on combined electrical-pneumatic power, pumps water-soluble adhesive through sealed supply line to point of use. — Marathon, Menasha, Wis. **(386)**

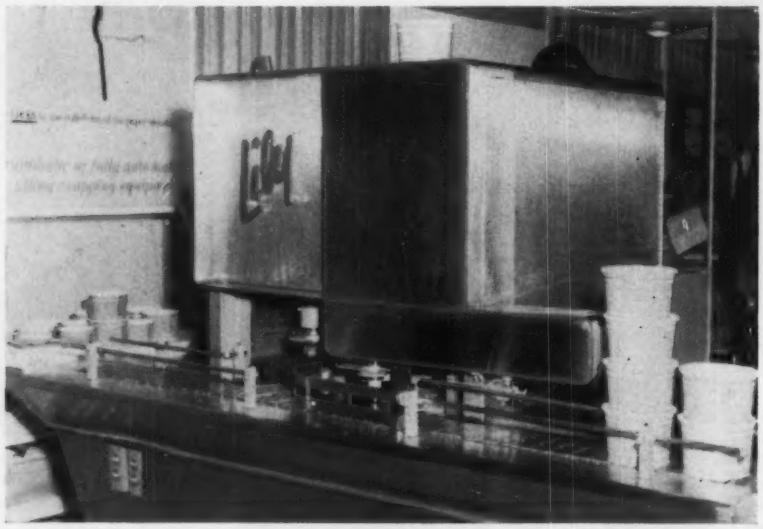


▲ **ECONOMICAL HOT MELT** applicator, using hopper-fed granular or pelletized resin adhesives, traces thin glue lines, for high-bonding strength of hard-to-seal materials. — National Starch & Chemical, N. Y. C. **(385)**



▲ **SEMI-AUTOMATIC SEALER** for poly or vinyl squeeze tubes, with up to 28 sealing stations, handles various sizes, changes over quickly for different container lengths.—Doughboy Industries, New Richmond, Wis. **(388)**

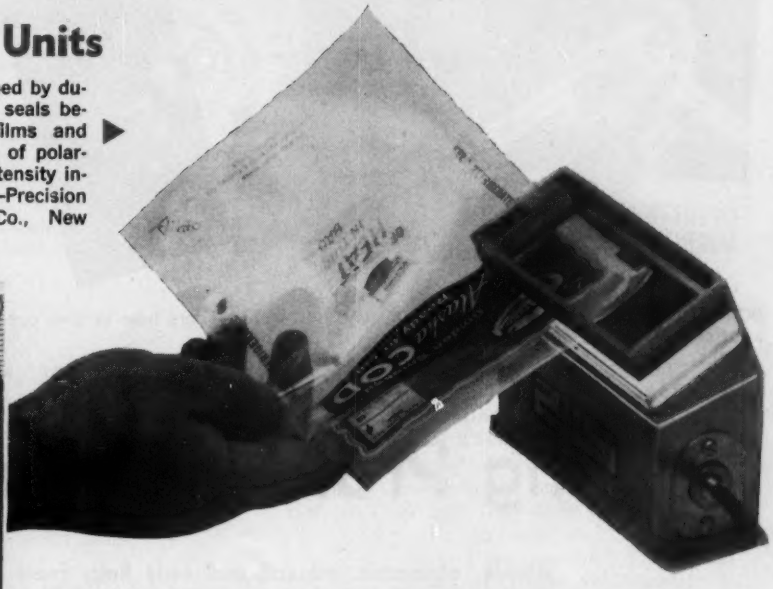
▼ **ROTARY, 6-HEAD UNIT** crimp-seals plastic lids onto paper containers at speeds up to 120/min.—Lily-Tulip Cup Corp., N. Y. C. **(387)**

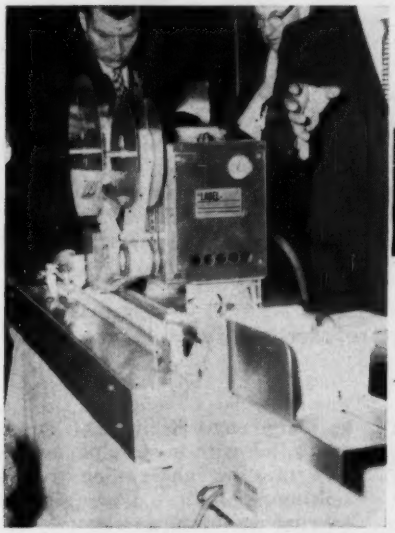


For more data, circle item numbers on Inquiry Card, back of book

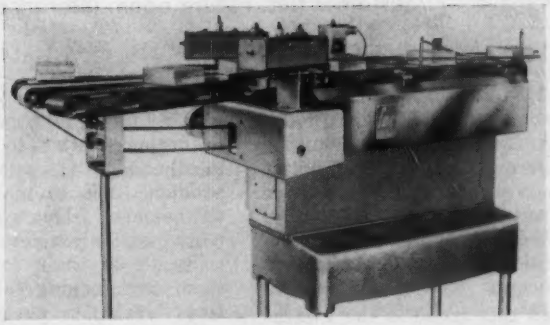
5 Other Top-Notch Units

HEAT-SEAL-O-SCOPE (developed by du-Pont) checks quality of heat seals between transparent plastic films and laminates by "rotating" axis of polarized light. Color and light intensity indicate quality of heat seal—Precision Machine & Development Co., New Castle, Del. **(389)**

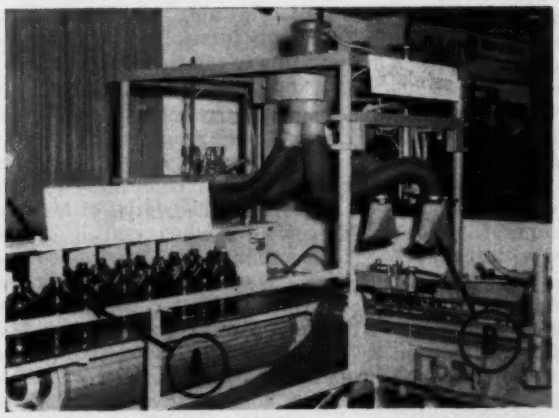




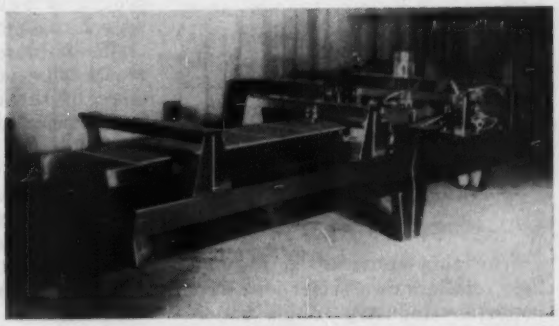
PRESSURE-SENSITIVE LABELER features in-coming air jet to peel label off backing, "shoots" it into exact position on package.—Kleen-Stik Products, Chicago. **(393)**



CHECKWEIGHER scales containers at speeds up to 300/min., routes them to 3-way segregating system that rejects "off-weights."—FMC Packaging Machinery Div., Phila. **(390)**



UNCASER (A) has pneumatic cup pick-up that assures gentle, positive action, rejects bottles with crowns, and operates at 1,000/min. speeds. Four-flap case opener (B) handles 25 cases/min., adjustable for various size cases, works on combination vacuum-mechanical principle.—Climax Products Div., Lodge & Shipley, Cincinnati. **(392)**



MULTI-DUTY MACHINE automatically forms shipping cases, accumulates packages, and packs them; features pneumatic drive to eliminate moving parts. Speed: 10 cases/min. — Schroeder Machines, E. Syracuse, N. Y. **(391)**

DO-IT-YOURSELF kit offered by General Mills tells store owners how to find out what shoppers think of them.

SPACE LAYOUT guide, by Stouffer, provides yardstick of sales and profits.

Building Profits Through Service

Simple, economic educational aids help food makers improve customer ties. Future boon: Insurance for stronger retailer loyalty

SELF-HELP programs for their retailers are giving forward-looking manufacturers a big competitive edge over rivals. By helping supermarket operators run their own business more efficiently, these food makers are adding new profit-making wrinkles to the service concept.

Behind this trend is the awareness so aptly put by General Foods Chairman Mortimer (see FE Jan. '59 p. 43): "We must strive for better understanding of our customers' problems, to make it more attractive for them to do business with us."

Thus, new self-help programs for retailers have just been unwrapped by General Mills, Stouffer, and Pillsbury (details below). And outfits like Armour and Standard Brands have uncorked special aids for the institutional trade.

What's Behind It?

Why this spurt of activity to help retailers do a better job? Five important industry trends underscore the service emphasis:

THAYER C. TAYLOR
Associate Editor, "Food Engineering"

► **Fierce fight for shelf space.** Never-ending flow of new items is forcing retailers to become more hardheaded in tossing out older product lines to make room for newcomers. Also, with more and more distributors resorting to EDP units to do their "ordering" for them—by keeping tabs on inventory levels, turnover rate, and profitability of individual items—salesman's role becomes smaller.

► **Spread of private labels.** Manufacturers, challenged to convince retailers of the profitability of advertised brands, are tailoring their programs to show distributors how to get the most out of promoted traffic-builders.

► **Distributors are now sparking more of the marketing functions that once originated with the manufacturers.** Thus, you see chains doing more advertising in the mass circulation magazines, as well as planning their own promotions.

► **Growing awareness by food makers that the distributor must be "sold" as well as the customer.** No matter how good the product is, and how extensively promoted, forward-looking firms admit, it's all for naught unless the distributor puts it "up front" where the final consumer-purchaser sees it.

► **Long-range decline of salesman's link with in-store personnel.** New tack by labor unions representing retail store clerks aims at barring manufacturers' reps from carrying out such traditional functions as shelf placement of goods, installation of special displays.

Face-Lifting Made Easy

Self-help aids to the retailer take many forms. But they usually have this in common—they're topical, and geared to a basic need.

Thus, General Mills' new "Operation Mirror" program, in preparation for 20 months, shows retailers how to do an image-rating job on themselves. Perceptive GM was well aware, when casting about for a program idea, that store image is a hot topic in retail circles right now. That's because supermarkets have grown so fast, and so imitatively, that they have a monotonous sameness. Now, retailers are striking out in all directions to make their store different from the competitor down the street. Then, too, where a private label is involved, they hope to build a store appeal with housewives that will cut across brand loyalties for national food manufacturers.

. . . and Institutional Fields

HOT FOOD SERVER helps Armour boost "canned meals" sales by giving snack shop chance to offer speedy "full course" entrees in 4-5 min.

MANAGEMENT TECHNIQUES are featured in "education" course Standard Brands makes available to restaurant operators.

Objective of GM's program, states Vice Pres. E. H. Andreson, is to give retailers "a sound, workable, and simple tool that permits development of accurate consumer images of individual stores." Used by firm's grocery products div., program was developed by research dept., who worked with outside fact-finding groups after learning there was nothing like it available to store operators.

Heart of the program is a 3-part kit that (1) pins down what the store operator needs to know to improve his store's customer image, (2) breaks out the steps to be taken in getting the answers, and (3) pinpoints how to analyze the new information and apply it to improved store operations.

Program's introduction was as carefully planned as were the build-up phases. In the first stage, covering two months, district sales managers made personal presentations to key chains and wholesalers. Following them in a second wave, over a 3-mos. period, GM field reps showed it to their wholesaler and retailer accounts.

In the frozen food field, where freezer footage is at a premium, Stouffer worked up a space allocation guide that is keyed to a store's characteristics. Objective, says James Biggar, marketing director, was to give retailers "something which was accurate and proven and which cut guesswork."

Preceding the guide were two years of actual store audits on the performance of Stouffer items in different types of locations. Findings are incorporated in a "Wheel of Fortune" device as well as a case-layout plan sheet. The "Wheel" shows what the retailer's weekly sales in Stouffer items should be according to the number of checkout counters he has, feet of freezer space, and whether he is in a high-income ($7,000 and up) or middle-income ($5,000 - $7,000) neighborhood. Literature which accompanies the "Wheel" estimates weekly profits.

Right-Hand Man Role

Noting that in-store merchandising is moving from a manufacturer-orientation to a retailer-based type, Pillsbury now offers "customized promotions" that ride this trend. By gearing its merchandising aids to retailer's objectives and needs, company will give active help on store-based problems.

Pillsbury resources, including company's own ad agency and a leading point-of-sale supplier, will be used to help retailers plan store-wide spectaculars, fashion copy for different media (including even billboards), arrange store decor, build customer image. The program supplements Pillsbury's regular promotions.

A special feature of the "customized promotions" aims at breaking new ground in food store merchandising. Thus, company hopes to introduce some of the more spectacular-type promotions that have long been a hit in the department store field.

A store qualifies for the Pillsbury program through a point system based on purchases of the company's products. The cost is expressed in terms of point values, which are earned through purchase and merchandising of Pillsbury items. In contrast, General Mills' do-it-yourself kit carries no price tag. GM estimates that it would cost a storeowner about $85 to carry out the "image" program.

Broader customer service is spreading in the institutional field, too. There, though, stress is on operating techniques, since promotions as such don't carry the weight they do in the retail sector.

To support its "Portion-ized" canned foods line, Armour now offers small-size public eating outlets a hot food serving unit.

According to J. A. Gray, manager, vending products div., the unit is aimed at the tens of thousands of small eateries whose menu is limited to hamburgers, hot dogs, milk shakes, and the like. By combining the server with Armour's institutional line of canned meals, Gray observes, these operators can now offer quickly prepared "main-course" items. A further advantage for the operator, Gray points out: Exact portion cost control.

Armour sells the unit for $47.50, but refunds the purchase price when the operator buys 300 cases of 24's. Server includes shelf space for 25 8-oz. tins, back-lighted menu panel to catch diner's eye.

A series of educational programs by Standard Brands aims at helping food service operators make better use of their employees. Need for the program, company says, is underscored by fact that 6 out of 10 food service workers leave their jobs each year.

First two courses, which include a variety of audio-visual aids, have covered "How To Train" and "How To Employ" workers. These subjects were chosen as program-starters after poll of trade groups and restaurateurs showed training and selection of personnel to be the most critical problems. (End)

new–lube-free

Sterling's variable speed drive never requires lubrication

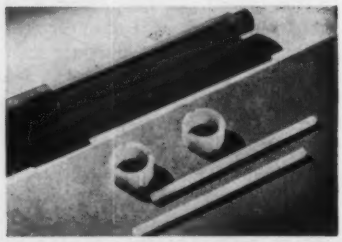
STERLING
Sealed and shielded bearings require no lubrication.
Keys are fabricated from tough elastic material to eliminate key and keyway wear.
Wear-resistant non-metallic bushings require no lubrication.
Shaft surfaces are corrosion-proof and require no lubrication.

All lubrication maintenance problems are eliminated by Sterling's new variable speed drive. Fret corrosion is completely eliminated. Sticky pulleys, resulting from improper lubrication, are no longer a problem. Belt life is lengthened; pulley wear is eliminated.

Special load-bearing surfaces never require any attention or lubrication. Keys and bushings will not wear out. Shaft surfaces are also tough and wear resistant.

Sterling's new "Lube-Free" variable speed drive can be installed in any location, no matter how inaccessible, since lubrication maintenance is no longer needed.

Complete application and product information is available by writing Dept. S-2, Sterling Electric Motors, Inc., 5401 Telegraph Road, Los Angeles 22, California—or by contacting the Sterling field engineer in your area.



Tough shaft surfaces provide unusual chemical resistance and anti-frictional properties. Specially fabricated keys and bushings hold up indefinitely.

Hathaway INSTRUMENTS INC.

Sterling Electric Motors, Inc.

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A Subsidiary of HATHAWAY INSTRUMENTS, INC.

CIRCLE 54 ON INQUIRY CARD

Tips to Management

Ease automation pressures

. . . Technologist mills?

. . . Migratory labor dilemma

'Togetherness'—Automation Solution?

Best way to face labor unrest when automation comes is to prevent it ahead of time. So keep a close eye on three big food firms—Armour, Campbell and General Foods—who are doing just that.

Via monthly meeting, the Armour Automation Fund Committee (backed by $500,000 from Armour) is searching for ways to minimize automation's impact on individuals and still take maximum advantage of technical advances. Committee is composed of management, impartial academic personnel, and two unions representing most of Armour's packing plant employees.

First practical application of this most prominent of all attempts to reduce automation pressures occurred in Oklahoma City where Armour had to close an obsolete plant. Some 58 employees accepted retraining offers and many more are now employed as butchers, beauticians, mechanics, etc. AAFC will submit its final report in August just prior to end of current bargaining contract.

In Sacramento, Calif., a committee recently set up by Campbell and a teamsters local is also preparing an employer-financed retraining program for workers displaced by machines. Plant's work-force has been cut by one-third but cooperative approach may smooth the transition.

At GF, similar solutions to automation are being sought. Cited is the case of 30 female calculating machine operators replaced by data-processing units. They're now being retrained as secretaries through GF's Educational Reimbursement Plan.

Better Technologists Needed

"We are not training well-rounded food technologists at the present time," according to Dr. Imri J. Hutchings, manager of food research for H. J. Heinz Co. and IFT president.

Speaking before Chicago IFT group, Dr. Hutchings observed that he had "great difficulty" in finding individuals properly trained for technology and that "higher qualifications are necessary."

"We don't want food technology mills to grind out second-rate graduates," added the Heinz exec, who also advised his fellow technologists to face up to their responsibilities to the consumer to produce for quality rather than just profit.

"Safety Crusade"—Good PR

Traffic safety and company public relations received a shot in the arm via a 13-week "Safety Crusade" sponsored in Milwaukee by Miller Brewing Co.

Courteous motorists were flagged down by key sales personnel with a card which reads "You Are a Safety Crusade Award Winner! Please Stop at Curb." Five awards of $10 each are presented seven days a week, up to a total of $5,000.

Bumper stickers with the word "Safety—Courtesy—Pays" were distributed to employees prior to start of the crusade. General public obtained stickers, which contain a dominant Miller soft-cross, by sending in handle from High Life six-pack.

"Savings & Security" at Swift

Government may be stopping Swift & Co. from diversifying its product lines, but the big packer may prove to be a top-notch savings bank.

Some 18,861 Swift employees, mostly salaried, saved more than $3.1 million last year under the first company-sponsored "savings and security" plan. Swift shelled out more than $1.1 million—50¢ for each dollar saved with a $1.20 weekly company limit.

Amalgamated Meat Cutters & Butcher Workmen and the United Packinghouse Workers rejected the plan, but the independent National Brotherhood of Packinghouse Workers agreed for 6,902 members.

About 89% of salaried employees are in the plan, which sees Swift put its contribution into Series E bonds or company stock.

Whither Migratory Workers?

Seasonal farm labor, which received an exaggerated airing on CBS-TV's "Harvest of Shame," is being turned into a focal point of union-organizing activity and danger warnings are up.

Most active is the Agricultural Workers Organizing Committee, AFL-CIO, which early this year began strikes and picketing of farms in the Imperial Valley of California and are moving into the San Joaquin Valley with more harrassing tactics.

Management approaches indicated, according to industry execs, are: (1) Get ready for unions by eliminating poor working conditions and improving overall personnel policies; and (2) join in an aggressive public relations program to remove the present image of the migratory worker from the public eye.

Actually, organization harassment may hurt, rather than help the seasonal worker. Beet growers are actively seeking "fuller utilization of spring mechanization." And in Traverse City, Mich., Cherry Growers, Inc., mechanically harvested 9% of last year's crop with good success. Mechanical "tree-shaking" technique is catching the eye of apple, peach, and pear packers. And machines for tomato harvesting are in development stage.

"Made OF Stainless Steel ...Made BY Jenkins"

And the "BY" is the most important word in that Spec!

Let's talk sense about stainless steel valves.

The material, the metal itself, is pretty much a cut-and-dried matter of *specifications* — selecting the right metal for a particular application. After all, the same alloys are available to *all* valve manufacturers!

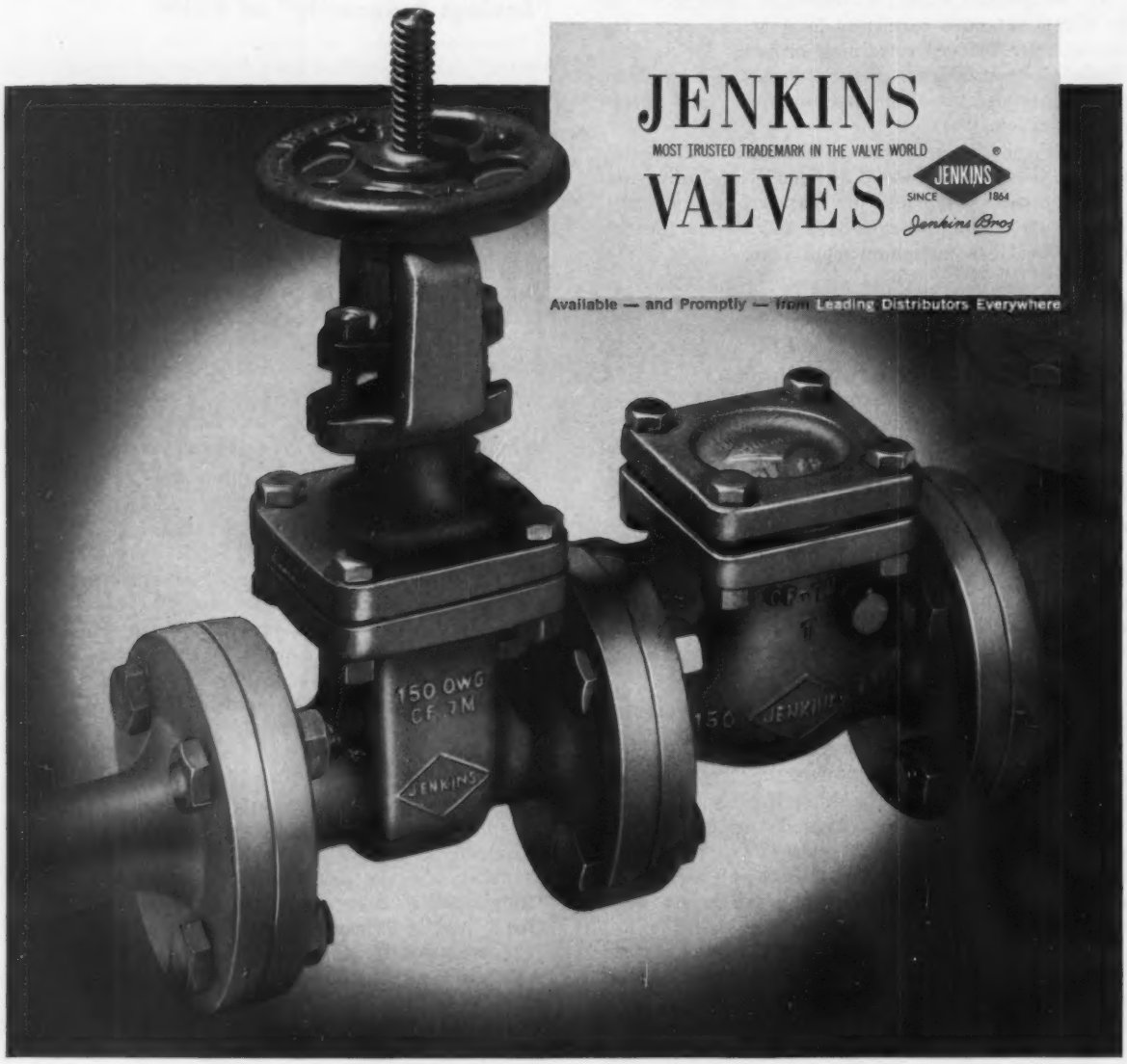
But —

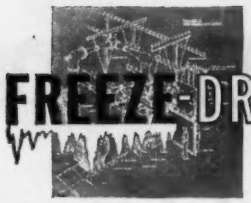
Just as is the case with iron or bronze valves, the basic and essential difference is in the *way* valves are made. *Perfection of castings . . . precision machining . . . sound design . . . painstaking inspection and testing —*

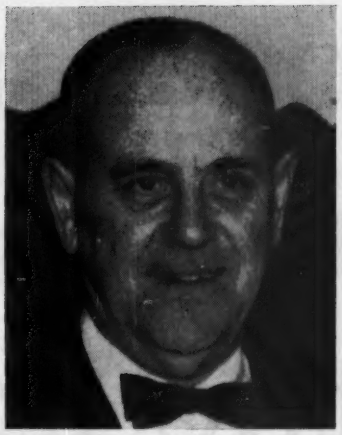
These are the really meaningful, the sense-making factors which impel more and more buyers to specify "BY Jenkins," along with the specification for a particular alloy.

At Jenkins every operation, every process, every test, every worker — all combine to fulfill the traditional (almost 100 years old!) standard of Jenkins quality — the very highest, the *standard* of quality for valves.

SEND FOR CATALOG 59-SS of Jenkins Stainless Steel Valves in types and alloys to fill 99 out of 100 application requirements. All made the Jenkins way to give you the longest, most dependable valve performance money can buy. Jenkins Bros., 100 Park Ave., New York 17.







Author **JOHN H. NAIR**

Internationally known food technologist and physical chemist, Dr. Nair reports highlights of technical freeze-drying conference in special FE article. He also authored "Freeze Drying, Where It Stands in Europe," FE March '61, p. 31.

Point Up Freeze-Dry Phenomena

Scientists from several countries report new facts about technical factors involved in freeze-drying at 3-day conference in Chicago

CRITICAL FACTORS involved in freeze-drying were analyzed at an international technical conference in Chicago, April 12-14. Underlying biochemical and biophysical phenomena, as well as engineering principles were discussed.

Speakers came from Western Europe, Canada, and South Africa, as well as the United States. Approximately 100 scientists attended.

Sponsor of the meeting was the Committee on Foods of National Academy of Sciences, National Research Council, Advisory Board on Quartermaster Research and Development.

Dr. H. T. Meryman, biophysicist, pointed out that the advantage of freeze-drying is attributable to prevention of shrinkage and of chemical change, as well as avoiding development of insolubility. The last factor is basically the only intrinsic value of freeze-drying. At −20C.(−4F.) to −25C. (−13F.), water can be removed without any injury, since the ice does not recrystallize at such low temperatures. The cells can be brought back alive if properly rehydrated. Mechanical forces and gradients are very great during dehydration.

Dr. Louis R. Rey, Paris, said that interstitial melting of ice of the still-frozen material is to be avoided. Ice structure affects desorption rate, as well as subsequent rehydration. Most foodstuffs can stand high interstitial temperature and still retain good organoleptic quality. Beef retains its structure at temperatures of −10C. (14F).

Dr. Rey described the various phases during the freezing and dehydration of liquids, such as milk or orange juice, observing that acids and sugars make drying difficult. He pointed out that there is no great benefit from using temperatures lower than the minimum of ice melting in the food material.

Dr. R. I. N. Greaves, Cambridge University, emphasized that it is necessary to dry below the lowest eutectic point. With coffee extracts, there is not much trouble at low concentrations but increasing difficulty at higher ones. One should use the lowest possible product temperature and the highest possible condenser temperature. The only two practical methods of heating are conduction and radiation.

Dr. Greaves described experiments establishing the desirability of applying radiant heating from both sides. With a block of coffee extract 1½ in. thick, drying time can be reduced from 38 hr. to 11 hr. by heating from both sides. If the dried shell can be scraped off continuously, drying rate can be enormously increased.

Why Deterioration

Basic deteriorative reactions were discussed by Dr. J. J. Connell, Aberdeen, Scotland; Dr. Harold S. Olcott, University of California, and Mr. Harold Salwin, Quartermaster Food and Container Institute. There are varying ideas as to the proper criteria for measuring deterioration. Changes in enzymatic activity are not a direct measure. Two kinds of deteriorative reactions are recognized. These are oxidative and non-oxidative. Which should be a matter of concern is problematical. Lipid oxidation generally occurs in foodstuffs. This is true of freeze-dehydrated pork but not of beef. Pigment oxidation is important as it affects consumer acceptance and nutritional changes.

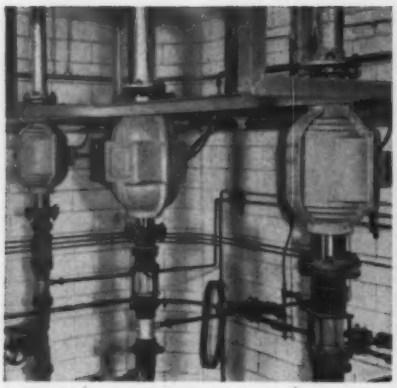
There is a question concerning the heme pigments after freeze-drying. It is not established whether these exist as myoglobin or oxymyoglobin after freeze-drying. Pigments oxidize after storage, as do carotenoids.

Dr. Connell noted that protein denaturation forms S-S bonds. At low moistures, proteins become insoluble with time, and this leads to toughening of the tissue. The extent of oxidative changes depends on type of product, method of process, residual moisture content, and desorption of oxygen from the drying material. It is difficult to retard oxidation by the use of antioxidants because it is impossible to get them into the dry tissues.

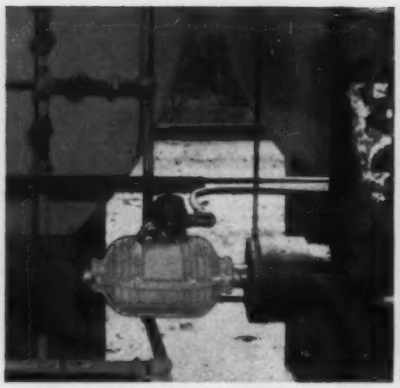
Nonenzymatic browning through

(Continued on page 61)

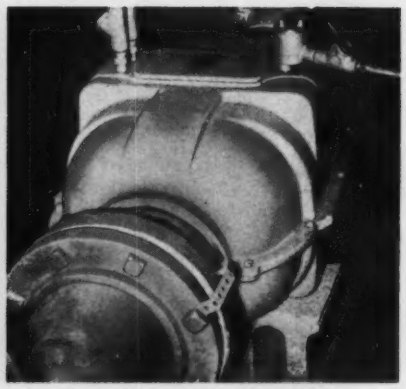
beer, starch, milk, coffee, the Foxboro Meter handl



Miller Brewing Company
uses Foxboro Magnetic Flow Meters to provide precise, automatic control of their flow to filters. Since Magnetic Meters have no flow restrictions of any type, they are cleaned "in place" by sending cleaners and ball brushers right through the line.



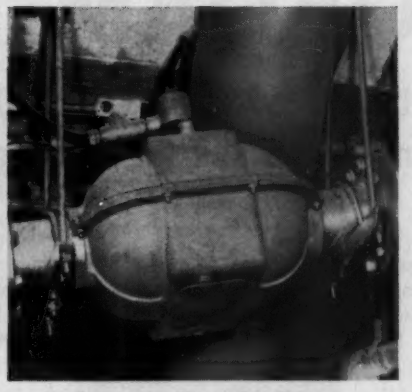
International Salt Co.
uses 6 Foxboro Magnetic Meters to measure 220° salt brine discharged from filters of Recrystallizer Process. Meters have corrosion-proof liners — give linear measurement, with an accuracy of ±1% of range across the entire scale. Meters are installed outdoors — need no protective housing.



Winebrenner Cannery
cut its town sewage tax by installing this 8 in. Foxboro Magnetic Flow Meter in effluent line. Town used to bill on basis of water consumption — now bills on flow meter readings. In canning season, when much water is shipped out with their products, savings are considerable.

molasses, juices, wastes... Magnetic Flow es them all

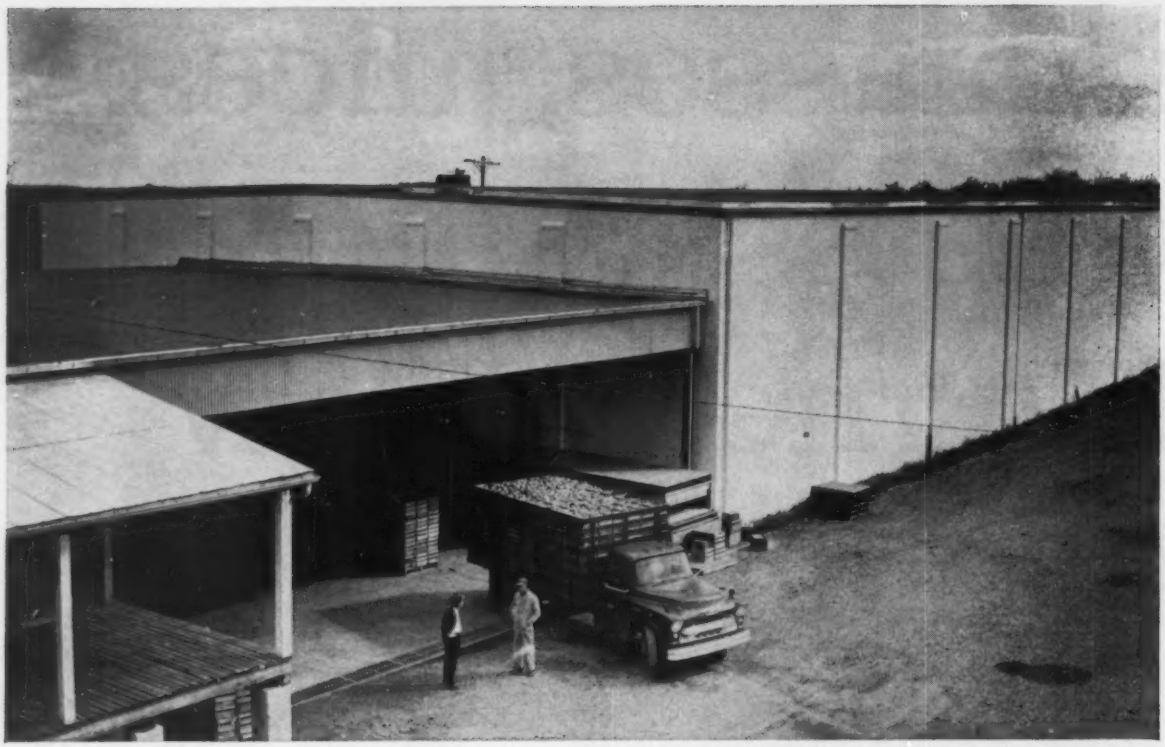
Ralston-Purina Company uses a Teflon-lined Foxboro Magnetic Meter to meter molasses into animal feeds. Flow rate is accurately controlled by Foxboro Dynalog Recorder-Controller shown above. Dynalog* instrument also provides instantaneous reading of flow rate, as well as a chart record of each 24-hour operation. *Reg. U. S. Pat. Off.*



Anheuser-Busch, Inc. Corn Products Dept. installed Foxboro Magnetic Meters to meter starch slurry direct from storage to converter. Measurement is made by electrodes flush-mounted in meter wall. Meter accuracy is unaffected by changes in slurry density, temperature, pressure, viscosity or chemical composition.

Write for
Bulletin 20-14
The Foxboro
Company,
305 Neponset Ave.
Foxboro, Mass.

FOXBORO
REG. U. S. PAT. OFF.

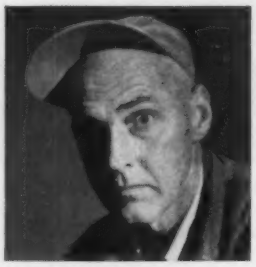


Musselman's new half-million cubic foot warehouse, Arendtsville, Pennsylvania.

STYROFOAM®

"It pays to select STYROFOAM and an Approved Insulation Contractor to install it!"

"Almost 43,000 square feet of Styrofoam insulation board keeps our new cold-storage warehouse at an even 32°F.," says Nelson Weber, Farm Technologist for The C. H. Musselman Company. "Styrofoam gives us an ideal storage environment—a critical matter for apple crops, much of which may have to be stored for several months before marketing."



Nelson Weber, Farm Technologist, The C. H. Musselman Company.

This new half-million cubic foot capacity warehouse at Arendtsville, Pa., is insulated with 4-inch thick Styrofoam, installed by a Dow Approved Insulation Contractor. The general contractor on this warehouse job declares, "Installation of Styrofoam by an AIC pays—we know he'll give us the best possible job because of the experience of his professionally-trained crews. High quality workmanship and a superior product (Styrofoam) add up to a thoroughly satisfactory job—one that's done right!"

Styrofoam—lightweight, rigid insulating material—has a low "K" factor that stays low. Its millions of tiny, non-interconnecting air cells provide high resistance to water and water vapor—water does not penetrate to freeze, swell and crack the insulation. And Styrofoam won't attract vermin, an important consideration in food storage.

The seal above is displayed by Dow Approved Insulation Contractors, chosen by Dow for their experience, business reputation, and high quality workmanship. The AIC takes great care to follow Dow recommendations for installing Styrofoam. For the names of Approved Insulation Contractors near you, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Dept. 1539KE5.

Styrofoam is a registered trademark of The Dow Chemical Company. It is applied only to the homogeneous expanded polystyrene made according to an exclusive Dow process. Styrofoam brand insulation board is available only from Dow and its authorized representatives.

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Stops moisture...

STYROFOAM®

for pipe covering insulation

Low-temperature pipe covering made of Styrofoam does an excellent job and requires minimum maintenance. Its unyielding resistance to moisture and its permanent low thermal conductivity prevent condensation and dripping—reduce heat transfer.

Pipe covering made of Styrofoam will not crack or split from thermal shock. Since it does not absorb water, it is not affected by ice build-up around uninsulated valves. It's lightweight and easy to apply. A complete line of pipe and vessel covering made from Styrofoam is available from the following fabricators:

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DOW

reaction of amino and carbonyl compounds occurs during storage. It is not always undesirable. It can be retarded by low moisture content, by low pH and by separation of reactants. While the reaction is a general one, the final products may vary, with different sugars particularly affecting the rate.

Dr. P. P. Carman, Pretoria, South Africa, discussed the transfer of water vapor from the ice boundary through the already dried shell. He viewed this as a diffusion phenomenon and developed equations for its evaluation.

Mr. W. H. Mink, Battelle Memorial Institute, presented equations on heat transfer in model systems. Prof. W. R. Marshall, Jr., University of Wisconsin, and Mr. John B. Lambert, du Pont, presented experimental data dealing with resistance at the subliming interface and the resistance to interphase transfer at the condenser. They also covered flow resistance through the dry cake and between cake and condenser. These data led to the development of mathematical formulas to express the relationships affecting each kind of resistance.

B. O. M. Gall of Phillips, Eindhoven, Holland, described commercial applications of microwave energy for industrial purposes. Both the magnetron and the klystron have been utilized for such purposes successfully. The implication is that we are much closer to the economical application of microwave energy in freeze-drying than has previously been thought.

Electronic Heating Advances

Dr. R. Decareau, Thomas J. Lipton Co., pointed out that extensive safety measures are required in applying microwave energy to freeze-drying. Now available are magnetrons which are guaranteed at 60% efficiency for six months' continuous use. Dr. Decareau advocated a dual system in freeze-drying. Here the moisture is reduced to 10% by conventional techniques, followed by application of microwave energy to reduce moisture to 2% in 1 hr. He appeared to feel that there are real improvements to be expected from such an approach. And he emphasized that matching energy eliminates ionization.

Dr. B. Kann of National Research Corp. discussed various instruments for determining the end point in batch freeze-drying. Variability in residual moistures of individual pieces makes this difficult. It is customary to use 2 hr. of extra drying to provide a safety factor, and this is expensive. One can neither weigh the ice on the condenser nor measure the material loss because rate of change is too slow near the end point. Vapor-pressure rise is a good alternative to measuring product temperature, a difficult procedure. A 10-micron reading indicates dryness, but this can be affected by leakage into the chamber. If latter is no more than 5 to 10 microns/hr., it is acceptable in a standard chamber.

Vapor-sample condensing is not a good method for determining end point. A radio-frequency mass spectrometer with an oscillograph may be used, but is expensive and difficult to apply. Infrared detection of the temperature on the surface of the particles by using a radiometer head and amplifier has been used, but its application presents many difficulties.

Dr. G. W. Oetjen, Leybold-Cologne, described experiments with the measurement of ice temperature by determining the equilibrium vapor pressure. This can be utilized to control heat input to platens if the system of heating is reactive enough. Dr. Oetjen developed a formula for measuring heat transfer.

Dr. W. R. Smithies, Toronto, reported improvement of heat transfer through use of spiked plates for the dehydration of meat. Dr. B. J. Luyet, Madison, Wis., noted that air bubbles remaining in the cellular structure cause difficulties in rehydration.

In view of basic data reported at this conference, the question was raised whether a company engaging in freeze - drying can afford not to do more fundamental research. (End)

"I think he's trying to tell us something!"

. . . first in Pouch Packaging

fmc announces the

STOKESWRAP "1000"

the completely new pouch-forming, filling and sealing machine with almost unbelievable versatility!

From FMC—who introduced pouch-packaging equipment and developed Stokeswrap, the standard of the industry — now comes the new "1000," a double-tube machine with all the advantages of two single-tube machines, but at less cost. The many new design features of the "1000" give the equipment an amazing flexibility that makes it ideal for large and small plants alike.

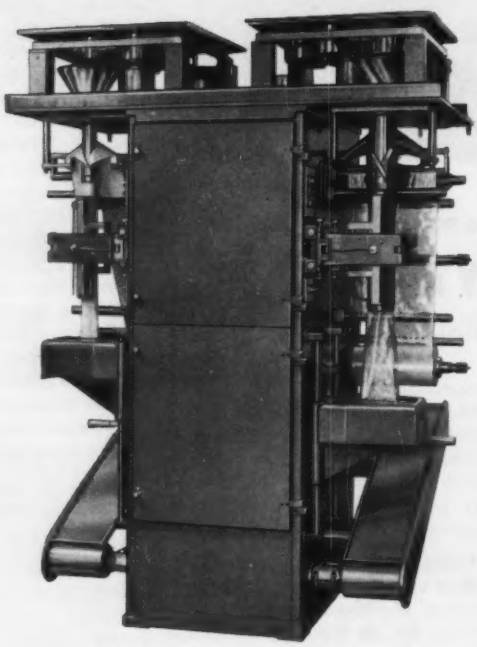
In addition to including all the proven Stokeswrap features for packaging free-flowing products such as frozen foods or candies, the "1000" has been designed to be the most versatile pouch-making machine available.

The amazing versatility of the "1000" is due to the separate drives that make it possible to operate either of the two tubes independently of the other.

The "1000" can simultaneously . . . run two different types of film . . . in two different sizes . . . with two different products . . . by means of two different feeds . . . with two different types of sealing method . . . and two different types of pouch . . . at two different speeds.

Further, production is continuous. If one side is shut down for changeover or maintenance, the other side continues to operate. And the "1000" can be purchased as a single-tube unit and the second tube added later, all at less cost than separate units.

PLUS ALL THESE FEATURES—Speeds up to 150 packages per minute. Sizes from 2" x 3" up to 8" x 14½" (with 200 cu. in. of product). New plug-in sealing mechanisms for quick change of sealing method. Side-mounted filling tubes and web rolls for easy "threading" and accessibility to moving parts. Practically every type of heat-sealable film, paper, foil or laminate. Quickly adjustable volumetric pocket capacities. Much less floorspace than two single-tube units. Waterproof filling mechanism for steam cleaning and washing down. And all with complete flexibility of operation.



Write today for complete details and specifications on the versatile new STOKESWRAP "1000."

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

FMC Packaging Machinery Division

Stokes & Smith Plant

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makes seasoning a science

The ability to create and produce a seasoning to meet your exact needs, plus the assurance that it is in compliance with Food Additive Laws—*IS A SCIENCE AT STANGE.*

The ability and versatility to produce seasonings such as Soluble, Liquid, 50-A Microground® and Ground for all types of finished products *IS A SCIENCE AT STANGE.*

The technical skill to control the flavor potency of each and every shipment to precise specifications—*IS A SCIENCE AT STANGE.*

The talent to create . . . the skill to produce . . . and the flexibility to fit your needs—*IS THE MOTTO AT STANGE.*

WM. J. STANGE CO., Chicago 12, Ill.
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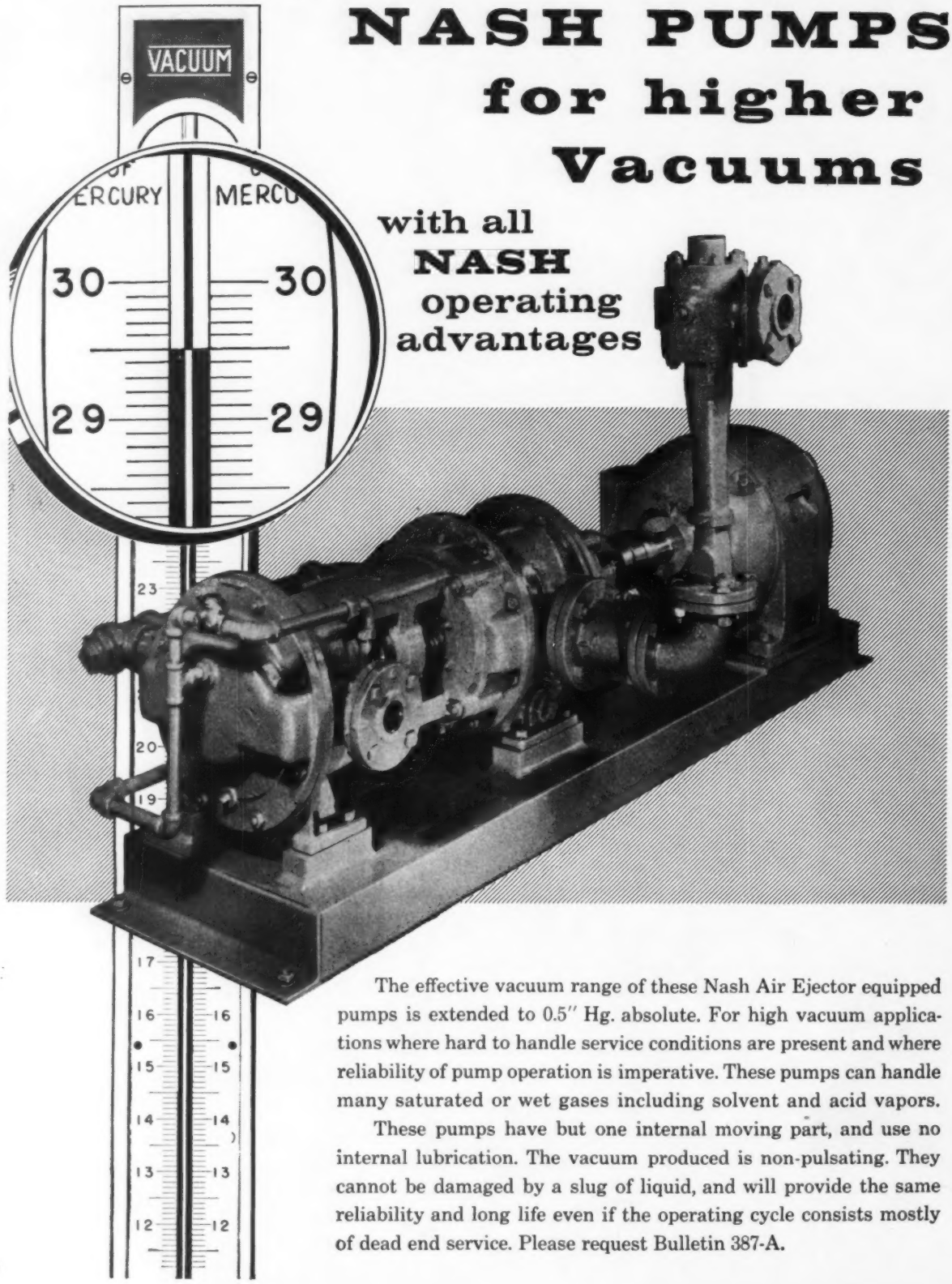
NASH PUMPS for higher Vacuums

with all NASH operating advantages



The effective vacuum range of these Nash Air Ejector equipped pumps is extended to 0.5″ Hg. absolute. For high vacuum applications where hard to handle service conditions are present and where reliability of pump operation is imperative. These pumps can handle many saturated or wet gases including solvent and acid vapors.

These pumps have but one internal moving part, and use no internal lubrication. The vacuum produced is non-pulsating. They cannot be damaged by a slug of liquid, and will provide the same reliability and long life even if the operating cycle consists mostly of dead end service. Please request Bulletin 387-A.

NASH ENGINEERING COMPANY

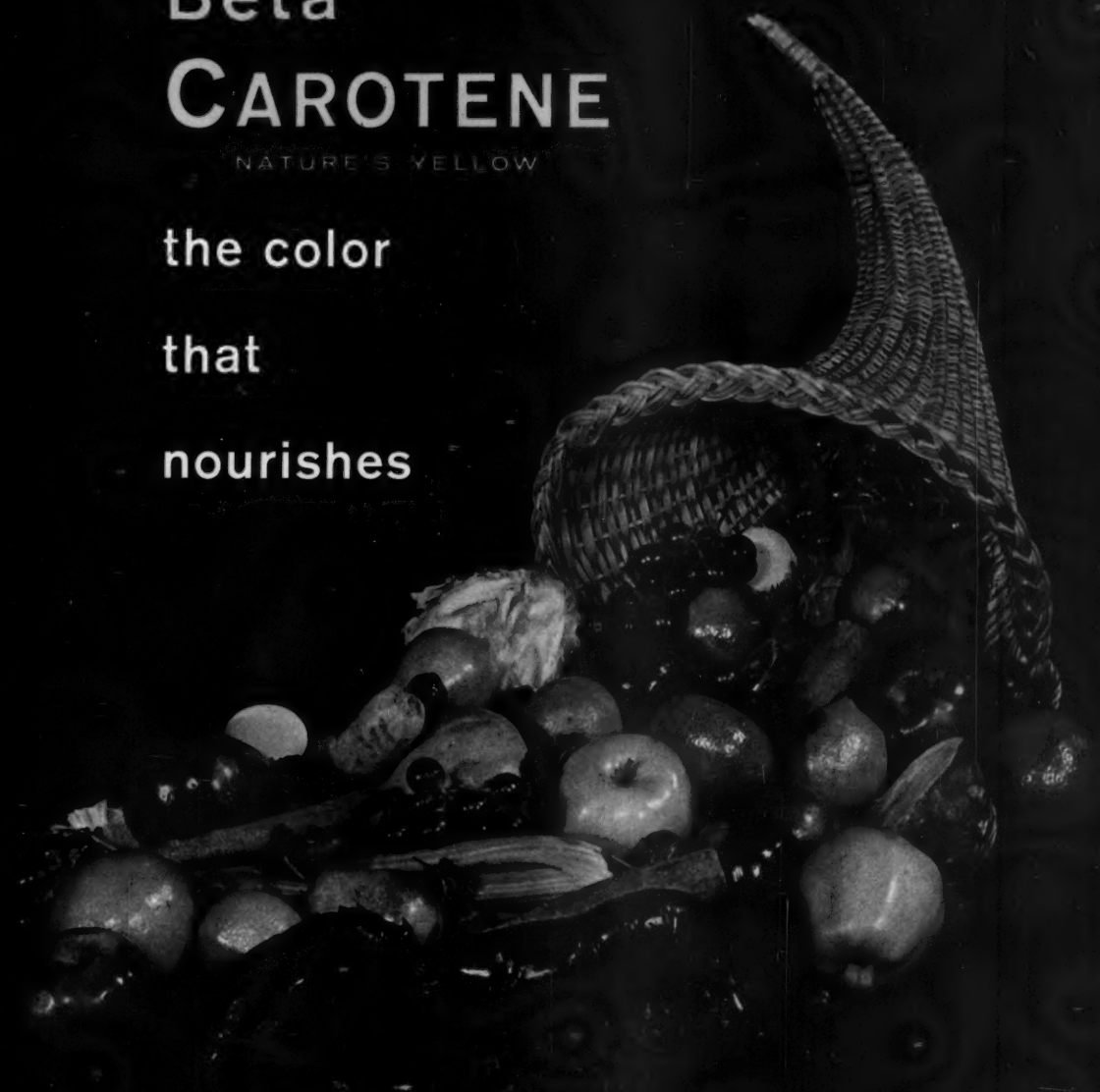
SOUTH NORWALK, CONNECTICUT, U. S. A.

KEEP FAITH WITH NATURE — GUARD HER GOODNESS

Beta CAROTENE

NATURE'S YELLOW

the color
that
nourishes



COMES RIGHT FROM ROCHE

FINE CHEMICALS DIVISION **HOFFMANN-LA ROCHE INC.**, NUTLEY 10, NEW JERSEY

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THE MODERN EXPANDED FOOD COLORING CONCEPT

COLOR NOURISH

WITH VERSATILE

ROCHE *beta* CAROTENE

USE ONE PRODUCT TWO WAYS

COLOR

Give your oil-base and water-base foods color versatility and variety—from appealing pale yellow to hearty, appetizing orange—with Roche *Beta* CAROTENE.

NOURISH

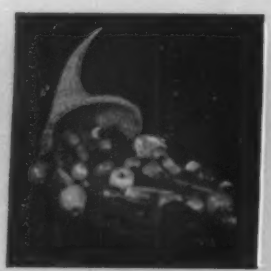
Give your oil-base and water-base foods the nutritional-plus added by Vitamin A value in "the color that nourishes"—Roche *Beta* CAROTENE.

VERSATILE ROCHE *beta* CAROTENE

THE EXPANDED 2-IN-1 FOOD-COLORING CONCEPT

COLOR PLUS NUTRIENT

Vitamins come RIGHT from Roche



FINE CHEMICALS DIVISION

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ROCHE

TYPICAL LEASING service garage in Sacramento, Calif., illustrates some Hertz customers and the truck models available.

Is Truck Leasing Right for You?

Leasing can be a big plus for your company—but make sure you have all the facts first. Here are some pros and cons—and food company reactions

SHOULD YOU LEASE or purchase trucking equipment for your business?

This question points up what can be one of management's most complex problems and an easy answer is not readily available. Decision depends on a variety of circumstances, not the least of which are your own particular needs, planning, and philosophy.

Certainly, if growth can be used as a measure of value, leasing must have its advantages. Since '45, truck leasing companies have reported a minimum of 10% growth/yr., while individual companies have even doubled their lease-rental fleets in a single year.

Unofficial estimates say 24% of trucks in the food and beverage industry are leased, emphasizing this industry's importance in leasing. Wheels, Inc., Chicago, a national leasing organization, places the value of auto and truck fleets leased in '60 by food processors at $194.7 million. This estimate for your industry is based on 28,500 trucks and 44,500 cars, 23% and 14% respective increases over '59. And National Truck Leasing System predicts truck leasing by this industry will have a 20% annual growth rate for the next four years.

O. K. LeBron, v.-p. and general manager of Hertz' Truck Leasing Div., defines modern automotive leasing as "a service for firms which must operate trucks or cars in connection with their business but wish to be relieved of the attendant responsibility and investment while retaining substantially all of the advantages of private ownership."

Two Basic Plans

Ordinarily, two types of truck leasing arrangements are available: Full Service and Finance. Full Service includes maintenance responsibility but latter involves just the truck itself. Variations of each type of lease are offered by the numerous leasing organizations (see panel).

FOOD Engineering checked with several food firms to get an idea of why they do or do not lease, what types of leases they use, and what they think of such arrangements. Here are some sample reactions.

►**Armour & Co.** leases practically all of its automotive and materials handling equipment under a Finance Lease. As agents of the lessor, firm has all responsibilities of buying, selling, etc. but does not hold title to the equipment. Armour feels the principal advantage of leasing compared to ownership is one of released capital, "since all of the basic advantages of ownership are retained."

►**F. & M Schaefer Brewing Co.** leases trucks of varying types in a fleet of approximately 400 units.

Arthur Jones, Schaefer's traffic manager, said firm leases because "We can give full time to the prime functions of our business. We don't have vast amounts of monies tied up in ownership of equipment and do have greater flexibility in equipment use. All leases are Full Service."

►**Arnold Bakers,** Port Chester, N. Y., utilizes common carriers for outbound bread shipments, and route trucks are owned by their distributors. Drawback to leasing mentioned is that it tends to be too expensive over a long period of time. "However, short-term arrangements (1-2 yr.) do have some

JACK L. MISCHOU
Assistant Editor, "FOOD Engineering"

← CIRCLE 68 ON INQUIRY CARD

Checklist of Leasing Types and Terms

Various types and methods of truck leasing are available depending on your needs and a particular company's program. Leasing companies will generally agree on the following definitions of types:

FULL SERVICE—User, or lessee, leases trucks under long-term agreement from the owners, or lessor, who is engaged primarily in business of leasing truck equipment. Lessor supplies full service for maintenance and repair of truck but leaves control of vehicle wholly with customer.

FINANCE—A long-term contract under which lessor covers only ownership and capital investment in the vehicle. Lessee supplies, in addition to driver, all repairs, lubrication, fuel, tires, garaging, insurance, etc.

TRIP—Both driver and vehicle are covered by a single contractual arrangement, frequently on a one-way trip basis with compensation usually based on the load carried. Lessor may be either a private or for-hire carrier, providing service to a lessee who holds necessary permits or certificates.

RENTAL—Identical to Full Service leasing except that vehicle is contracted for a short term such as an hour, day, week, or month. Term simply differentiates renting from long-term leasing.

GYPSY—A term often used to describe illegitimate variations of trip-leasing, carried on as a subterfuge to avoid necessary operating authority and collection of tariff rates.

DRIVER-OWNER—A long or short term contractual arrangement covering combined services of truck and driver, latter being also owner and operator.

None of the above arrangements should be confused with these services and facilities: Guaranteed Maintenance plans (equipment manufacturer supplies maintenance); Purchase contracts; For-Hire Trucking (contract hauling or common carriage); Local Cartage (Occasional or "steady house"); Equipment inter-change (arrangements among common carriers); Leasing of Operating Rights; Fleet Management Plans.

(Definitions: National Truck Leasing System)

benefits depending on the type of unit and operation," firm adds.

►**Thomas J. Lipton's** traffic manager, Brayford Edwards, feels that "leasing equipment rather than outright ownership is more advantageous to us primarily because we have no facilities for servicing trucks and we are always assured of equipment."

Under a Full Service arrangement, Lipton operates three Faegol Vans for local deliveries, one B61 Mack Diesel Tractor, and one Veenamo and Wiggins van for over the road intra-plant moves.

GF Experiments

General Foods is experimenting with leased refrigerator equipment for LTL distribution of frozen foods. GF reports use of leased trucks offers the advantage of flexibility in meeting changing volume requirements during this experimental stage.

"We own no equipment at this time," reports J. Harold Wright, firm's Manager of Transportation Development, "and the small fleet we do operate consists entirely of leased equipment."

Piel Bros., N.Y.C., which leases 80 vehicles from Hertz' Truck Leasing Div., has been doing it for six years. Ralph Chaben, Piel's traffic manager, notes, "During this period, we have been able to devote the time we formerly spent in fleet operations to develop a better delivery service to our customers."

A major Midwestern dairy owns most of its trucks and leases only a few units. Firm feels it can operate its own fleet at cost as compared to leasing "which requires a loading of some sort in the form of a fee or profit to the lessor. Leased trucks are under a finance arrangement and the only advantage here lies in special circumstances, which are usually of short duration."

"We feel that ownership is more beneficial to us for one reason—cost," reports a leading Eastern baking company. Firm adds, "There is very little doubt in our minds that the cost of leasing is greater than the cost of ownership. While leasing companies tell you their profit is in discounts on parts and purchases of parts and vehicles, it stands to reason that they are working on borrowed capital just as we are. And they, too, have to earn a profit."

While the baking concern now owns its complete fleet of walk-in and body-chassis delivery equipment, it did lease a portion of this equipment until the end of last year. "We did feel an advantage to leasing," company official points out, "since it freed people to take care of other duties. Our lease arrangement was Full Service, whereby the owner took care of all needs including gas and oil, charging us on a weekly and mileage basis."

Disadvantage noted by this firm was a belief that "company owner-

Dairies, Meat Packers Lease Most Trucks

Here is a breakdown of truck and auto fleets leased by individual segments of the food and beverage industry in '60:

Category	Leased Trucks	Leased Autos	Value (million)
Dairy	5,500	.....	$ 16.5
Meat Packing	5,400	4,300	26.9
Brewers	4,000	4,500	23.2
Bottlers (soft drink)	3,500	7,500	28.2
Baking	2,800	8,000	28.4
Confectionery	1,800	3,200	13.4
Coffee & Tea	1,250	3,000	11.2
All Others	4,300	14,000	47.9
Totals	28,550	44,500	$195.7

(Source: Wheels, Inc.)

ship 'encourages' the driver to be a little more careful with a vehicle, knowing the company is going to have to maintain and pay for any abuse he may inflict."

Several other firms reported that they leased all or part of their fleet because of the advantages pointed out by leasing companies —release of capital, management time-savings, easier budget planning, elimination of maintenance facilities, etc.

Only Marginals?

One of the major criticisms of leasing is that only marginal companies lease. "Sound companies own their own trucks and fixed assets," say many executives.

This objection doesn't seem valid and may be more psychological than real. However, it is difficult to test because most leases are Full Service wherein the company is usually more interested in the maintenance feature than in the conservation of capital.

Wheels, Inc., numbers Sara Lee, American Molasses, American Home Foods, and many others among its customers. National Truck Leasing System, a group of many individual leasing concerns throughout the country, serves hundreds of big and small companies.

And Hertz lists names like Morrel (125 units), Anheuser Busch (300 units), Canada Dry, Pepsi Cola, etc. Many other leading leasing companies such as Ryder handle several anything-but-marginal firms.

Of course, leasing does have particular appeal to small concerns. Companies not large enough to enter national credit markets must depend upon local sources of funds, which can be difficult. Leasing allows them to acquire medium-term or long-term capital for natural expansion of production facilities and sales development.

Obviously, there are many advantages to leasing your trucks instead of owning. And you can be sure these will be pointed out to you by the various leasing company salesmen (see panel on Pros and Cons of Leasing). Then, too, many of your competitors may be leasing their fleets and salesmen will say this means you should, too.

But all is not quite that simple. Your particular situation may be entirely different than the next firm. And leasing is certainly not the answer to all equipment needs. In many cases, traditional finance methods are preferable.

Know Thyself

The best way to judge whether or not to lease is to really know your own situation. You should know exactly what each part of your transportation is costing you in order to compare the figure that a prospective leasing salesman will give you.

Some of the areas that you should have dollars-and-cents knowledge of include: Depreciations, insurance, repairs, tires, accounting, interest on capital, taxes, gas and oil, plus many more.

Certain questions should be asked concerning your company. Do you require special equipment? Would released capital really help you? Can you relocate personnel and use the space formerly given to fleets properly?

In effect, you must have the facts about your own operation before you can make an intelligent decision as to whether leasing is right for you.

Beyond this knowledge, one firm uses the following condition as a rough guide to knowing when it's better to lease: when regular financing is undesirable; when depreciation practice limits progress and profit; when credit and liquidity might be wrongly affected by purchase and ownership; and when purchase is not the most valuable use for capital. (End)

Pros and Cons of Long Term Leasing

Long term leasing arrangements, such as Full Service and Finance types, offer a variety of special attractions. But disadvantages, too, are inherent to each and it will pay you to understand both pros and cons before making a leasing decision.

Under Full Service, most commonly mentioned features are:

- **Release of Capital**—Lessees can utilize capital formerly invested in transportation and maintenance equipment for modernization, expansion, marketing, and other parts of the business.
- **No Maintenance Worries**—Maintenance becomes the responsibility of the leasing company who must provide night crews, large parts inventories, road service, preventive maintenance, periodic replacement, etc.
- **Executive Time Savings**—Management can devote more time to scheduling, safety, training, etc.
- **Simplified Budgeting**—Since transportation costs are fixed under leasing, a simple means of setting up automotive expenses is established—pre-planned budgeting. Only one weekly or monthly bill must be paid and supporting records are eliminated since all operating expenses are deductible.
- **Engineered Equipment**—Trucks are designed specifically for a particular user's needs, providing special models, makes, etc. Equipment is painted and lettered to customer's specifications.

Most common objections to this type of leasing are:

- **Cost**—The dollar outlay is generally agreed to be higher for leasing than for ownership. Impartial statistics have shown this to be the case, although there is not universal agreement on this point.
- **Loss of Control**—While you will know your costs in advance, it can be difficult to control or reduce them. Too, you have no real assurance that you're going to get the service that's promised, although this can be less of a problem if you choose one of the many established and reputable leasing companies.
- **Potential Labor Problems**—You may be faced with the task of laying off or transferring a number of mechanical and shop personnel, unless the leasing company takes them over.

Many manufacturers who already have maintenance facilities just want to lease trucks and will provide their own services. Consequently, the newer Finance Lease is becoming more and more popular. Its main advantage is the release of capital investment in fleets but certain other features such as engineered equipment, better control of costs, use of existing facilities, etc., are also noteworthy.

However, it is usually agreed that the Full Service type is better than the Finance Lease where:

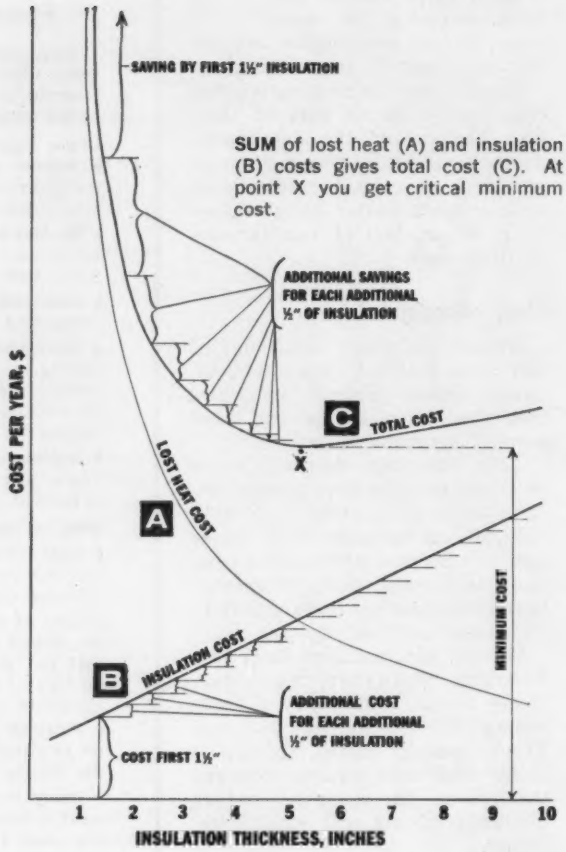
. . . Trucks are operated over extremely rough terrain.

. . . Perishable product shipping dictates standby equipment.

. . . All truck expenses, including maintenance and repair, must be budgeted in advance.

Engineering breakthrough now permits lower heat costs with . . .

Economic Insulation Thickness


SAVING BY FIRST 1½" INSULATION
SUM of lost heat (A) and insulation (B) costs gives total cost (C). At point X you get critical minimum cost.
ADDITIONAL SAVINGS FOR EACH ADDITIONAL ½" OF INSULATION
C
TOTAL COST
X
COST PER YEAR, $
LOST HEAT COST
A
B
INSULATION COST
MINIMUM COST
ADDITIONAL COST FOR EACH ADDITIONAL ½" OF INSULATION
COST FIRST 1½"
1 2 3 4 5 6 7 8 9 10
INSULATION THICKNESS, INCHES

ASK YOURSELF: "How much can my company save at a savings rate of $2/ft. of pipe/yr.?" It can be appreciable.

These savings can be achieved with the proper change in the thickness of installed pipe insulation. That is if you don't have correct high-temperature pipe insulation now. And the chances are you don't. Studies have shown that lines up to 700F. were underinsulated by 30 to 50%, while lines over 700F. were overinsulated.

As a result of a joint study by Union Carbide Chemicals Co. and West Virginia University, it is possible now to determine what thickness of pipe insulation is most economical for your plant for a given insulating material. Such a determination can be done quite rapidly by means of a manual which these two groups prepared after a year of study.

ALEX K. PORIANDA
Managing Editor, "Food Engineering"

Critical Cost Factors

In data preparation for the manual, three classes of factors had to be considered. These are:

► **Heat factors**
Cost of fuel; capital investment in heat producing equipment and the heat distribution system to point of use; cost of money for capital investment; interest on investment; depreciation period; maintenance; and, number of hours of operation per year.

► **Insulation factors**
Capital investment of installed insulation; cost of money for capital investment; interest on investment; depreciation period; and, maintenance cost.

► **Physical factors**
Temperature difference; shape —flat, curved, inside and outside radius; and, conductivity of insulation, mean temperature.

Basis of the study is McMillan's formula—itself rather complicated. Relationships of the formula are shown quite simply, however, in the accompanying graph:

. . . **With bare pipe** your cost of heat loss is maximum. As you add insulation this cost drops as shown by curve A.

. . . **Insulation cost** goes up as you increase insulation thickness. This is shown by line B.

. . . **Total cost of heat/yr.** is the sum of cost of lost heat/yr. and insulation cost/yr. This is shown by curve C.

. . . **Minimum cost** is at that insulation thickness below which you lose heat and above which added insulation becomes added cost.

This economic insulation thickness is what you have to determine for a given insulator under your plant operating conditions. This is where you can save money on your present pipe insulation, or gain maximum efficiency if you're building a new plant. And you don't have to understand all theoretical considerations to accomplish this.

Preparation of Data

With limits imposed on each of the factors above, over 53 billion combinations were possible (simply a product of the factors). This meant that many graphs also. By observing relationships and establishing single variables, this figure was reduced to 273,000 combinations.

It would have taken the fastest electric calculator 500 man-years to work up this many combinations. It took 83 hrs. of running time to do this on an IBM 650 Computer.

With this data worked up, a manual was prepared for 20 manufactured thicknesses (from ½ to 36 in.) of insulating materials. It is this information, laboriously prepared ahead of time, that you use to determine the economic insulation thickness for your plant's piping.

How You Use Data

To determine the economic insulation thickness of any phase of piping in your plant, you need operating data and cost data. The former can be easily supplied by your engineering department and the latter by accounting (it makes no difference what accounting system your company uses).

Let's try a sample calculation.

Operating data:

(a) Nominal pipe size.....8 in.
(b) Operating temperature ...200F.
(c) Ambient temperature .....50F.
(d) Type of insulation. Cellular glass

Cost data:

(e) Depreciation period of insulation .....15 yr.
(f) Depreciation period of plant .....15 yr.
(g) Plant capital investment $12/lb. steam/hr.
(h) Total production cost of steam....$0.90/1000 lb. steam
(j) Installed cost of one inch insulation on a one inch pipe .....$1.60/linear ft. x in.

Step 1.

Using Table 1 in manual, for above data (a), (e), and (j), you read off the Cost of Insulation Factor "B". This value is 1.045.

Step 2.

With this value of "B", and for data (f), (g), and (h), you read off on a set of charts a "D" factor. The value of "D" is 0.0070.

Step 3.

$$\text{Mean temp.} = \frac{\text{operating t.} + \text{ambient t.}}{2}$$

$$= \frac{200 + 50}{2} = 125 \text{ F.}$$

On a chart (Fig. 10 in manual), for 125F. and from the Cellular Glass curve, you read off the thermal conductivity factor "k". This value is 0.4.

Step 4.

$$\text{Temp. differ.} = \text{oper. t.} - \text{ambient t.}$$

$$= 200 - 50 = 150 \text{ F.}$$

In the 8 in. pipe-size section of Table 2, and for the obtained values of D = 0.0070, k = 0.4, and temp. differential = 150F., you determine the thickness to be 1.5.

This means: Under the given conditions, the economic insulation thickness is 1½ in.

Thus, by having the necessary data (operating and cost), and with the aid of the manual, you can determine the economic insulation thickness for given conditions in your plant. You can obtain the manual by writing to Engineering Experiment Station, West Virginia Univ., Morgantown, W. Va. (End)

The largest national beverage company in its field, after study and tests, recently adopted Steelcote EPO-FLOOR TOPPING to protect concrete floors from corrosion of food acids and alkalis in its newest plant.

Here are the reasons:

Easy application, monolithic groutless cleanliness, resistance to acids, alkalis, moisture, strength many times that of concrete, and non-slip surface that fights abrasion.

For maximum protection at minimum cost specify Steelcote Epo-Floor Topping on your next job. For complete information write, wire or phone.

STEELCOTE MFG. CO. • 3418 Gratiot, St. Louis 3, Mo. • Rodney, Ontario, Canada

MIKOYAN plant, Moscow, packed these products. It turns out great variety of items, including baby foods, compressed soup mixes, cereals.

Inside Russia's Food Plants

Some innovations seen, and fast progress is possible. But plants generally are antiquated, output small, and quality poor

PART II—
Achievements in Canning

RUSSIA APPEARS to be 20 to 30 yr. behind the United States in its techniques of food processing and distribution. Most of the canning equipment is considerably inferior to ours. In technology and methods, Russia is far behind the United States.

But the Soviet could make rapid progress through concentrated effort, if the State so decided.

It seems to members of our delegation that Russia's greatest single resource, manpower, is employed with gross inefficiency. Most of the packing, stacking, and moving of products still is done by hand. There is great deficiency in automation.

Technological skill and the desire to satisfy consumer needs are two guideposts of the American food processing industry. These certainly are lacking in the Soviet counterpart. Marketing methods and display techniques are poor. People have a very limited selection of products from which to choose, and much of that is of inferior quality by our standards. This results, of course, from the "take it or leave it" attitude on the part of their government.

With more than one-sixth of the Earth's land area and a population of over 210.5 million people, Russia claims to produce 4.3 billion containers of canned foods each year. The United States, with a land less than half as large and a population of 180 million, averages about 24 billion containers of canned foods annually—nearly six times as much.

The U. S. produces some 1,200 different canned food items, as against only 200 to 300 from the Soviets. Our country operates about 2,200 canneries, or 11 times as many as the approximate 200 claimed by the Soviet Union.

We obtained little information about health and sanitation practices. Workers and plants appeared quite clean, even if obviously "spruced up" for our visit. But there was an appalling lack of adequate restroom facilities.

Quality control leaves much to be desired. There seems to be little effort to make a better or graded line of product. Soviet canners need not be concerned with competition.

Most Soviet canned foods are packed in heavy returnable glass jars. Russian canners advise that they are attempting to increase their output in metal, but as yet they don't have a highly developed tinplate industry.

Many food processing plants, large and small, have their own can manufacturing divisions. Capacity is low, however, and labor expenditure is staggeringly high. No plant claimed to pack more than 50% of its product in tin.

Canners Make Candy

Canneries are utilized year-round, but not always as canneries. For instance, the Lenin cannery at Odessa produces fruit juices, fruits, compotes and baby foods. But in the winter it turns to such meat items as tongue in jelly and kidneys in tomato sauce.

Meat products are packed in the

MILAN D. SMITH
1960 President and Executive Vice President-Elect of National Canners Assn., Washington, D. C.; also president of Smith Canning and Freezing Co., Pendleton, Ore.

Spends Month in Russia

Author Milan D. Smith traveled extensively in Soviet Union during month tour of Russian food plants and research institutions. He was member of team of American food experts led by Dr. G. E. Hilbert.

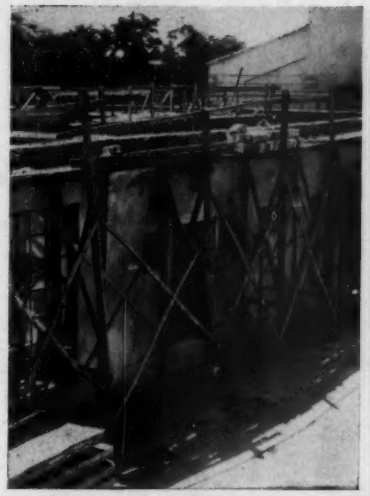
winter also at the First of May plant at Tiraspol, and metal containers are manufactured there also. During the off-season, the Stalin plant at Kherson processes 4,000 tons/yr. of candy called Halivah—a compound of sugar, corn syrup and sunflower seeds.

At the Lenin plant, incidentally, I saw examples of very poor utilization of labor. A black plum compote was being labeled by hand. There was no palletizing in the warehouse. Glass jars were stacked "bright," and a layer of thick paper was placed between every other row or product.

But just think of it! Each of those small glass jars had been placed in the stacks by hand. Each jar would eventually be taken down by hand and after labelling would be cased by hand, in wooden boxes.

There is keen interest in supermarkets, but very little accomplishment to date. Russia has not developed much in the way of built-in-maid service, convenience foods, premixed foods, or combinations. A plant in Leningrad, however, is putting out canned Russian meat ravioli, ready to serve after cooking 10 min. Total production is 65,000 tons/yr. The ravioli are made on an automatic machine with a capacity of 2,640 lb./hr. In the First of May plant in Tiraspol, they are producing canned meats with beans, with peas, with rice and with macaroni.

How does the average Russian eat? He gets enough quantity, but the quality and variety leave much to be desired, by our standards. There is a shortage of meat available for household use, but it seems to be more plentiful in restaurants. Fresh fruits and vegetables are not often available out of season, and when available the quality is rather poor.



EXPANSION is characteristic of Russian canneries. Here is new construction at a small plant in Odessa.

How Plants Operate

► **Tomatoes** are the most important canning crop in the Soviet Union. At Kherson we visited a plant named for the late Joseph Stalin. There canned tomato juice was processed for 30 min. at temperatures ranging from 85 to 95C. (185 to 195F.). Most of the tomato paste packed at the Stalin plant had a concentration of 32% solids. Some ran as low as 30%.

A new tomato paste division reportedly will be able to handle 150 tons of raw material every 24 hr. on each of its four lines. New stainless-steel evaporating equipment is expected to achieve a concentration of 40% solids.

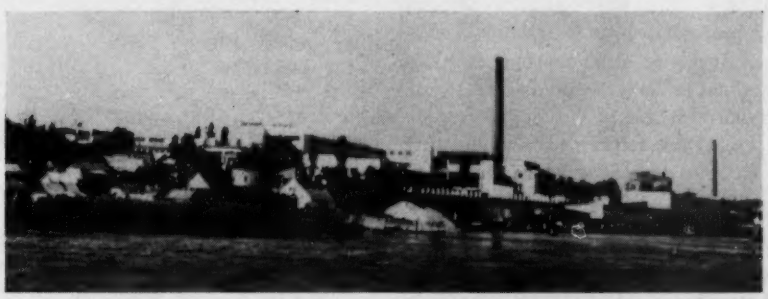
The Kherson plant has an annual claimed capacity of about 100 million containers of which 43 million are tomato paste, 11 million tomato juice, and 5 million tomato ketchup.

This plant devised a new system for bringing in tomatoes from the fields. First, the raw product is collected at a center in or near the fields where the tomatoes are inspected, washed and cored. Next, the tomatoes are crushed, passed through a finisher to remove peelings and seeds, and placed in stainless-steel bulk containers with a raw product capacity of 4 tons each. These containers then are transported to the factory where the crushed tomatoes are processed into paste or other products.

The Soviets also claimed to have made some progress in freezing tomatoes. Moscow Refrigeration Institute is working with temperatures ranging as low as −50C. (−58F.). The tomatoes they had frozen were no larger than 5 cm. (a little over 2 in.) in diameter. They admitted under questioning that the frozen tomatoes showed substantial damage to the cellular structure.

► **Corn**—After Khrushchev visited America, he recommended expansion of corn canning and potato chip output. In 1959 Russia produced 5 million cans of corn (standard container is 400 grams or 0.88 lb.). The goal is 25-27 million cans by 1965. This still would represent only about one-thirtieth of our pack of corn.

Some plants in the Republic of



STALIN CANNERY at Kherson packs ▲ more than 100 million cans and jars annually — fruits, vegetables, meat products.

RUSSIA'S BEST food-trucking equipment looks like this. These are stainless-steel trailers and tractors at Alma Ata meat plant. ►

Seabrook Farms Cooks Delicious Meat Balls In 10 Minutes With A Fostoria Infrared Oven

Seabrook Farms, of Seabrook, N. J., speeds processing and improves the quality of quick-frozen meat balls with a Fostoria Infrared oven. Just 10 minutes are required to turn out meat balls with "firm crust, excellent color, juicy interior and good texture."

Dozens of other food processors have found that Infrared ovens cook faster than any other method and can easily be controlled to heat or cook at any desired speed. Fostoria Infrared cooking is cleaner than other non-electric methods . . . does not require oven preheating . . . costs less and occupies less floor space than conventional ovens.

Foods cooked by Fostoria Infrared ovens retain more moisture . . . yet will not absorb fat as with deep-fat frying or braising. A growing number of food processors are using this efficient, modern technique to cook or partially cook fish, meat, vegetables and chicken prior to freezing.

Write for "Radiant Heat – Applications Unlimited", Infrared Division, Fostoria Corporation, Fostoria, Ohio.

FOSTORIA

Moldavia, we were told, both can and freeze corn. Corn on the cob is being frozen, but as yet no cut corn.

► **Peas**—An amazing amount of hand-labor was involved in handling this crop. At one plant, 50% of the acreage of peas had been hand-picked by crews of women.

In-plant methods and techniques also are antiquated. From eight viners located at this plant, peas are carried by belt and bucket elevators to blanchers and ripple pans. Then they go via short flume to a de-watering device and onto the inspection belt. Another bucket elevator takes them to a hand pea and bean filler.

Neither this machine nor the closing machine was operating at speeds above 75 cans/min. One operating line was handling no more than 3 tons of product/hr. There were no quality graders or sieve size graders in the line.

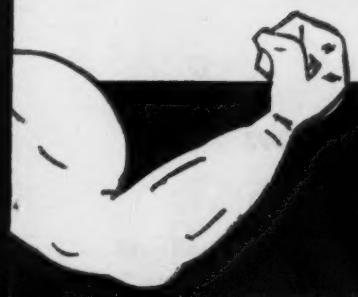
Frozen pea packaging is archaic. Peas are taken from the end of the belt on small trays and carried to several packaging tables about 15 ft. away. There women scoop the peas into cartons. Weighing is manual, one carton at a time.

► **Cherries**—The Tiraspol plant and the Lenin plant process cherries. The former plant freezes 10 tons of finished product per shift in seven small freezing chambers. Cherries are run over an inspection belt and then placed on small trays or pans and hand-carried to several nearby tables. Women scoop up the product and pack each carton individually, weighing each on a small scale. There are no cellophane inner linings in the cartons.

Cartons are formed by hand, and after filling and sealing they are placed on trays, which in turn were put into slots on a "buggy" and pushed into one of the seven chambers.

► **Baby Foods**—The Odessa plant produces a squash puree. This is homogenized and intended for infants of six months and over as a supplement to mother's milk. There is said to be close cooperation with various scientific and nutrition institutes on baby foods, both as to technology and recipes. New recipes for different baby foods are being developed, not only for infants but for older children. The product for older children will not be homogenized, but will contain diced or sliced ingredients. (End)

PROTEIN 29% HIGHER



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SPAGHETTI • DOG FOOD • BREAKFAST CEREAL • USE PERMITTED
IN UNSPECIFIED LOAVES IN FEDERALLY INSPECTED MEAT PLANTS

Griffith drew upon the spice flavor skills of its corps of chemists to solve the research problem of a decade! By patented process of wet-milling soy flour, Griffith *removes that soybean flavor!* Produces economical and stable sodium proteinates that contain 29% more protein and 33% more lysine than soy flour! Learn all the advantages of using either ISOPRO or PROMAX in your products for high-protein health appeal. Write your name and the request, "Send facts on ISO-PRO and PROMAX", on your letterhead and mail it today.

U.S. Patent No. 2,881,076

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Biogen is a completely new apparatus which produces extremely large quantities of specific microorganisms quickly, economically and continuously, under well defined conditions.

When the continuous process is not required, the Biogen provides excellent conditions for the efficient production of batch cultures.

For the first time, investigations requiring large populations of microbial cells become fully practical in such diverse fields as Bacterial Physiology, Enzymology, Genetics, Pharmacology, Fermentation Studies, and Virology (including Bacteriophage).

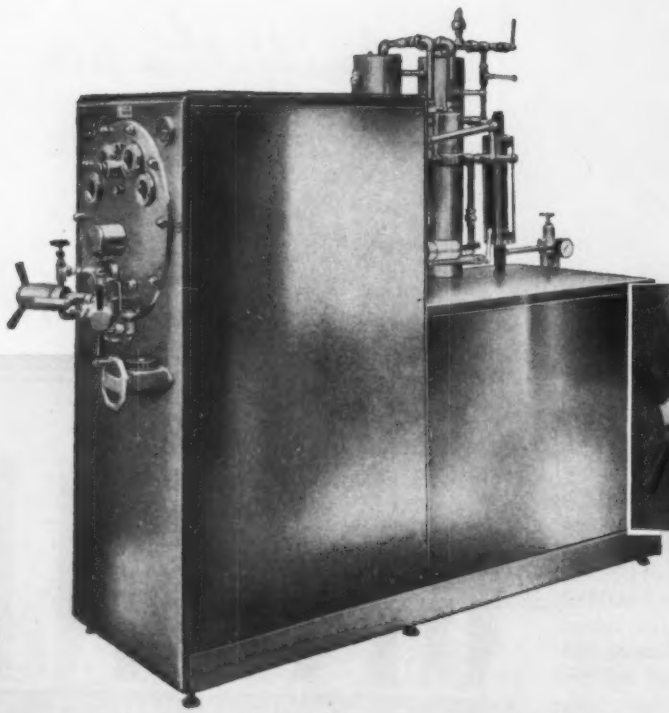
The Biogen is self-sterilizing and has complete controls on the front panel which govern the sterilization cycle, speed of agitation and the temperature within the chamber. Four independently steam sterilizable valves permit sterile sampling.

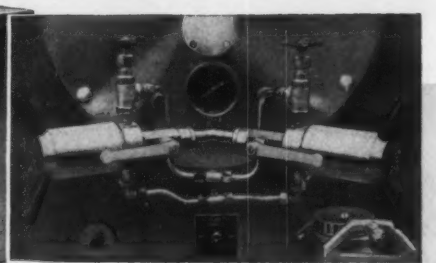
Chamber temperature is maintained at ± 1° C. within a range of 20° C. to 85° C. Electrically powered incinerators provide a sterile air intake for aeration of the medium within the chamber as well as sterilization of the effluent air.

In a recent typical run with *E. coli*, a maximum population of 1.8×10^{10}/ml. was attained. Furnishings for a complete Biogen laboratory are available from the American Sterilizer Company. Typical equipment includes: A full selection of Water Stills, Premix Tanks, Cooling Bath and Coil, Centrifuge, Refrigerators, Freeze Drying Apparatus and Steam or Gas Sterilizers. We invite inquiries as to your specific needs.

•

Write for technical literature . . .
Bulletin IC-605R.





Four independently steam sterilizable valves such as the two illustrated above eliminate danger of medium contamination. Two electrically powered incinerators are standard on the Amsco Biogen . . . for air intake and effluent air. For critical laboratory work an additional effluent incinerator is recommended.

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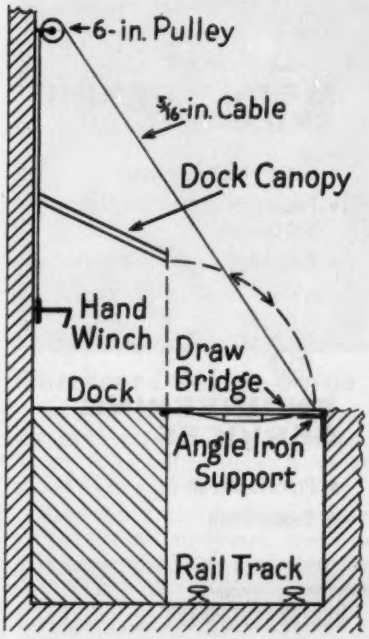
Practical Ideas

Inexpensive Drawbridge Cuts Labor Requirement

We've built a low-cost, yet adequate, retractable bridge spanning RR track between building and loading dock. Used as a thoroughfare by personnel and hand trucks, the runway (see sketch) is hinged at one end by two apron plates (½x2x8 in.), which are recessed in dock-supporting parapets.

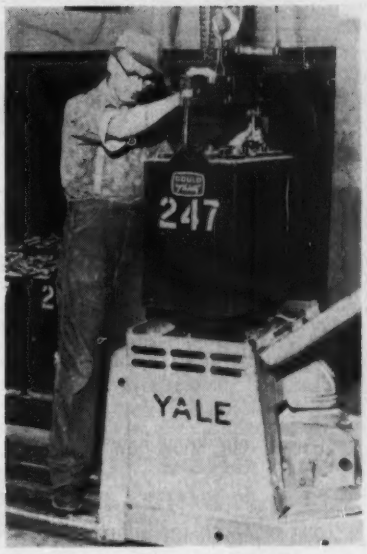
Hinged in this fashion, runway can be raised when RR cars are moved along spur. Lifting is by



means of a 5/16-in. wire cable anchored to building-side of bridge, passing over a 6-in. pulley mounted dockside and then secured to a hand winch (spur and pinion gear).

Wooden bridge is constructed of five 2x10 in. planks with angle-iron frame-work. Formerly used runway was counterweighted, required 3-4 men to pull cable that was hook-secured when bridge was in the elevated position.—*John May, General Manager, Grayslake Gelatin Co., Grayslake, Ill.*

BATTERY PERFORMANCE and long life depend on regular cleaning with soda, water, and a brush.



SPREADER BARS apply vertical lifting force, which prevents bending the battery box.

10 Pointers That Extend Battery Life

Proper maintenance of batteries used in industrial trucks extends their service life considerably. Here are 10 rules that simplify the job:

1. Select batteries of adequate capacity—They must supply power for peak load operations. Substituting a smaller battery almost always results in its being overdischarged, which lowers its efficiency and service life.

2. Inspect on schedule—A check list prevents omitting such items as vent plugs, water level, and voltage test.

3. Keep records—Charging and maintenance operations should be filed as a case-history. This helps to diagnose troubles in operating and charging equipment.

4. Do not overcharge — This causes gassing, overheating, loss of water, and possible permanent battery damage.

5. Give boost charges — When trucks do extra-heavy work or work extra hours, a brief charge given during a lull in the work cycle prevents overdischarge.

6. Schedule equalizing charge—An additional charge of 3-4 hr. at the finishing rate brings each cell up to full charge. It should be given at least once a month, but not more than once a week.

7. Charge idle batteries — A freshening charge once every three months keeps them fully charged.

8. Make repairs promptly—Although seldom required, battery repairs are sometimes necessary because of cracked containers, internal shorts, or rough handling.

9. Replace old batteries — Efficiency drops rapidly after a battery delivers less than 85% of its rated capacity. Replace it at this point.

10. Use spreader bars — Batteries should be lifted by spreader bars so the lifting force is vertical. Use of chain slings will bend the battery box.—*R. Hopewell, Manager, Field Engineering, Gould-National Batteries, Inc., Trenton, N. J.*

(Turn page)

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Many of our customers have found that they can increase their profit and make better products with gelatin by making use of our know-how and our research facilities.

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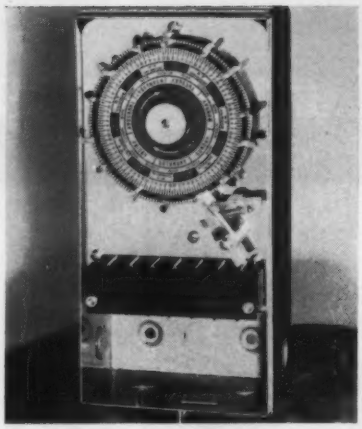
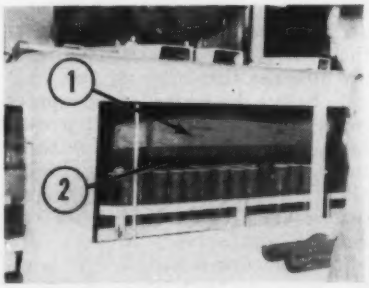


Time Switch Has Its Own Power Source

Power failures can be annoying and expensive, and with time switches on the line, they can be disastrous. The illustrated time switch eliminates the hazard.

It has an independent 12-hr. power reserve built into both its 24-hr. and 7-day elements. Operated by spring action, the power device does not stop during power failure. It automatically changes back and forth from electric to spring drive, when necessary, to keep the switch ready for action.

When basic power is restored, the spring automatically rewinds. Switch is supplied by *Lumenite Electronic Co., 407 S. Dearborn St., Chicago.*



Efficient Jar Dryer

We dry glass jars coming from our spray-type continuous cooler because labels won't adhere properly to wet jars. Such drying avoids the unattractive appearance of jars with wrinkled labels. Moreover, it eliminates the extra work of soaking jars to remove labels, and then relabeling the jars.

We use a two-way drying system consisting of an air blower and heater. Both are installed at discharge end of cooler, just before

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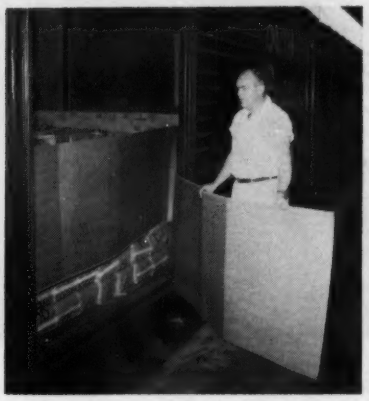
right-angle transfer of filled jars to labeling machines.

The blower is a 30-in.-dia. fan with reverse curve to reduce noise. It is driven by a 7½-hp. motor (3,000 rpm.), and blows high-velocity air through a 1 x 7½-ft. diffuser (1, in photo). Latter fans most of the water off the jars. Diffuser has ¼-in. baffle plates spaced to circulate high-velocity air around the jars.

The heater jets 125-130 F. air at a pressure of 15 psi. through perforated pipe (2), mounted horizontally over the outcoming jars. Pipe is drilled with 3/16-in. holes spaced 1-in. apart. Air is heated in a ¼ x 7-ft. pipe section that houses a 2-in. steam pipe.—*Don Praught, Production Manager, Wm. Barnes, Inc., Minneapolis.*



Fiberboard Guards Cargo

We used to spend $1,200 a year for steel strapping, and another $2,500 to install it across doors of cereal cars loaded at our plant.

However, a thorough study has proved pre-cut fiberboard sheets to be a good substitute. Replacing the strapping with fiberboard has cut doorway damage to products and saved nearly $3,000 a year.—*W. Cameron, Warehouse Dept., Carnation Co., Oakland, Calif.*

"Hello" Messages—When you telephoned FMC during the last national election, you heard this message: "This is Food Machinery, reminding you to vote." This technique might well be applied by all industry, not only in national elections but when an important issue is at stake and public action is needed, either nationally or locally.

New dry process imprinter for pouches, bags, wraps, strip packs

"WRAP-A-PRINTA"® packaging machine imprinting attachment Patented

• Makes crisp, opaque, really permanent impressions in any color • Uses low-cost roll leaf instead of ink . . . perfect for "hard-to-print" films, coated foil, waxed paper • Fits in idle space on all pouch, bag, wrapping, bundling machines • Fully automatic . . . synchronizes perfectly with continuous or intermittent web feed • Imprints anything from tiny code-date to 4" x 2" design • Ideal for short cutoffs on pouch machines—as short as ½"!

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Filter paper in complete range of grades available . . . samples furnished for testing or send us your materials for testing. Also filter cloth: cotton, wool, felt, glass, Orlon, Dynel, Saran, silk, Dacron, Polyethylene, Filyon, Nylon, Poly-Propylene and others . . . cut and sewn to your required sizes and shapes.

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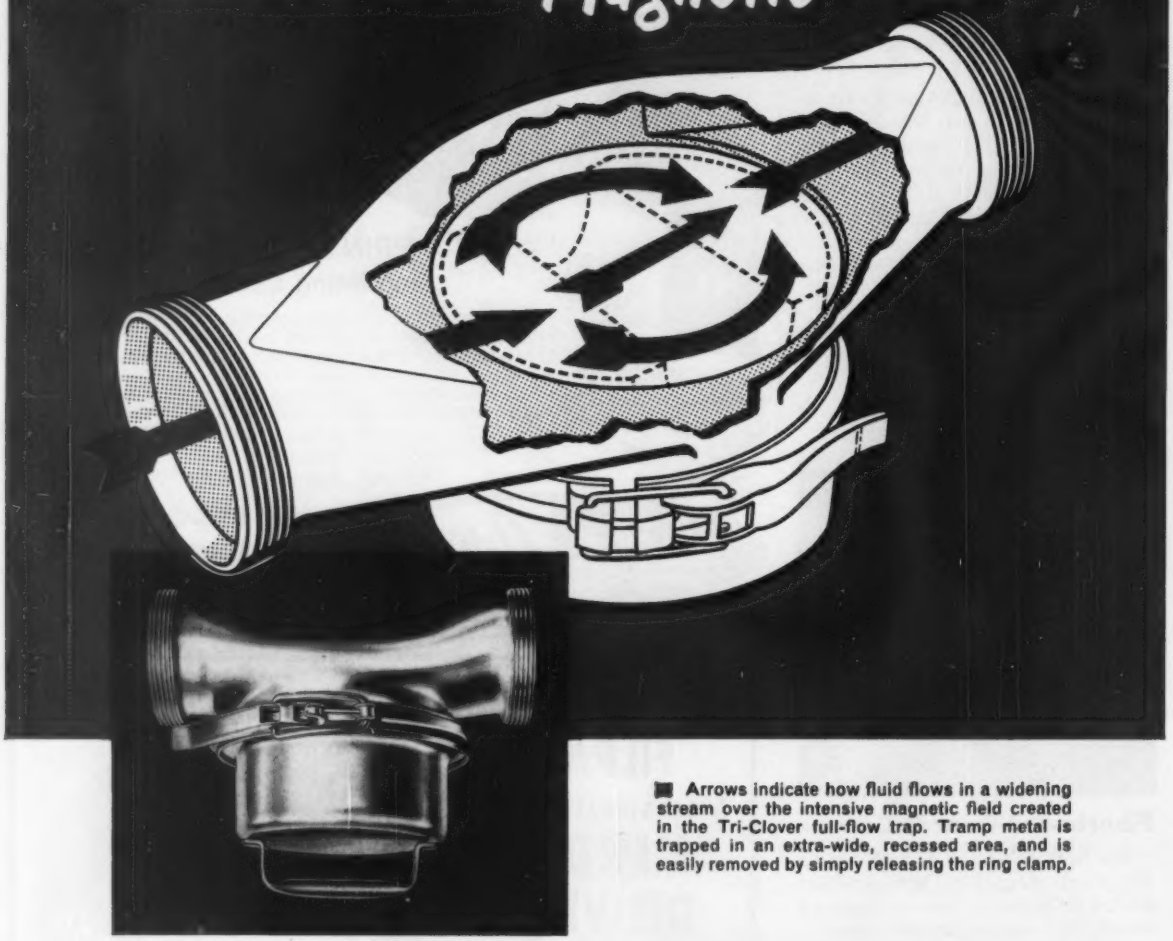
Eliminate the hazard of stray metal in your liquid conveying lines with TRI-CLOVER *Magnetic* TRAPS



■ Arrows indicate how fluid flows in a widening stream over the intensive magnetic field created in the Tri-Clover full-flow trap. Tramp metal is trapped in an extra-wide, recessed area, and is easily removed by simply releasing the ring clamp.

Here is the best way to eliminate the hazard of stray metal in your liquid conveying lines . . . tramp metal that can cause product contamination and damage costly processing equipment. With Tri-Clover Division's full-flow Magnetic Trap, positive protection is assured. Simple, streamlined design permits easy removal of all trapped foreign matter through instant disassembly of the trap body and magnet housing unit.

These Tri-Clover Magnetic Traps employ an extremely powerful non-electric Alnico one-piece permanent magnet to assure maximum removal of tramp metal. They are available in both Sanitary (polished finish, with Acme Threads) and Industrial (pickled finish, I.P.S. threaded or flanged) construction in 2″, 3″ and 4″ sizes. Both types are fabricated from wrought sheet type 316 stainless steel, and offer maximum corrosion-resistance, streamlined flow, with minimum product agitation and friction.

Write for further information, or see your nearest TRI-CLOVER DISTRIBUTOR.

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Tri-Clover Division
Kenosha Wisconsin

Doing It Better

SANITARY STEEL FLOOR of milk-cooling room enables easy, less noisy sliding of stacked cases.

PLATES are bonded to the floor with special epoxy adhesive that resists erosion by lactic acid.

ABBOTTS DAIRIES

Cites Merits of New Steel Floor Plate

In renovating its Norristown, Pa., branch plant, Abbotts Dairies has pioneered the use of a specialty floor plate—12-in. squares of rolled steel that are fixed securely to the floor with a new epoxy adhesive.

Installed in much the same manner as household floor tile, the flooring provides several significant advantages:

1. Its ribbed surface provides relatively few contact points with the bottom of a milk case, thus affording easier, less noisy movement of stacked cases.

2. The adhesive used is specially formulated to resist erosion by lactic acid. It fills all floor joints to give a smooth surface that is easily cleaned and sterilized.

3. The shatterproof flooring is completely germ and vermin proof.

According to W. Reichert, Abbott's Industrial Engineer, "Welded flooring sheets had previously been used. However, this type of installation often resulted in buckled plates, hollow spaces under the flooring, and pin holes in the welds. The epoxy adhesive should, on the other hand, give a firmer base to the plate and be completely satisfactory from the sanitary viewpoint."

The flooring has been installed in a new 116x30 ft. constant-temperature cooling room (photo), also on loading platforms, and in case-stacking and bottle-storage rooms. Called "Super Diamond Pattern," it was supplied by Alan Wood Steel Co., Conshohocken, Pa. **(201)**

VINES POULTRY CO.

Eases Turkey Freezing

A screw winding on a flexible shaft efficiently moves turkeys through a ceiling freezing room at Vines Poultry Co., Osgood, Ind.

Turkeys rest in baskets that hang from hooks. Latter engage the rotating screw which, powered by a ¾-hp. motor, slowly moves the baskets along the 45 ft. shaft. Space for this simple overhead conveyor system was provided simply by building the freezing room higher. This entailed no increase in floor or roof areas, which are the most expensive in freezing rooms.

A plenum chamber, containing the system, was built near the ceiling so low-temperature air from blowers could be directed toward the turkeys for freezing, then deflected downward to be used for holding. In effect, then, the room consists of a freezing tunnel along the ceiling and a holding space on the floor.

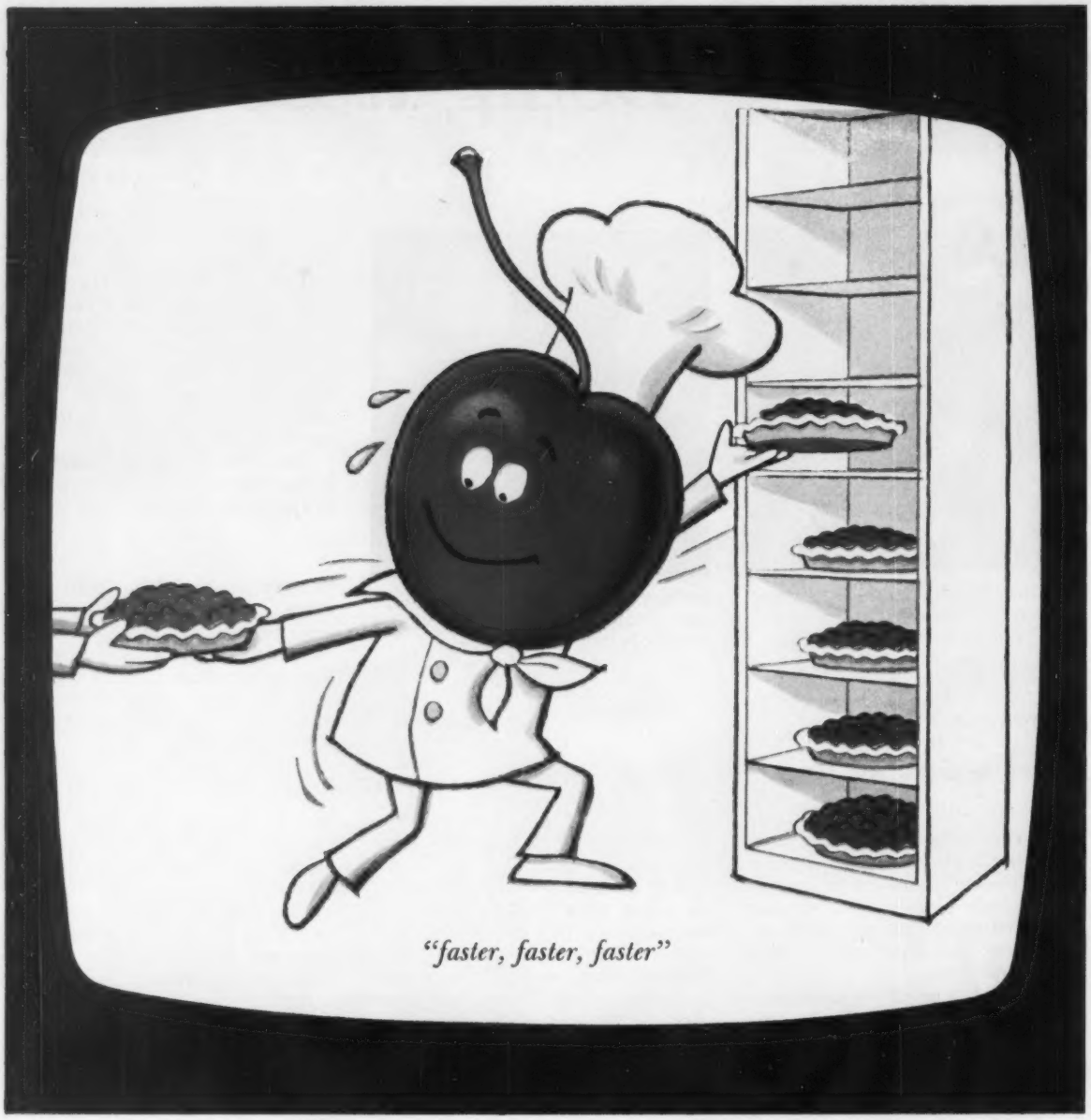
The system, called "Spiraflex," is manufactured by Cherry-Burrell Corp., Cedar Rapids, Iowa. **(203)**

Skipper Meats, Inc., San Francisco, automatically interleaves meat patties, beef steaks, etc., with one or two sheets of wax paper, then accumulates them in stacks of 1 to 6. Labor-saving unit used is made by Toby Enterprises, San Francisco. **(205)**

W. F. Schrafft & Sons Corp., Charlestown, Mass., has new polyethylene confection trays that are easier to use, eliminate contamination hazard, and cut costs. Produced by W.R.H. Products Co., Rumford, R. I., units also stack to save space. **(206)**

Dulany Foods, Inc., Exmore, Va., uses a stainless-steel belt to carry vegetables through its inspection station—the first application of this kind for a steel belt. Supplied by Sandvik Steel, Inc., Fair Lawn, N. J., unit was chosen for its ease of cleaning, impermeable surface, and superior resistance to vegetable acids and sanitizers. **(207)**

Pillsbury Co., New Albany, Ind., eliminated a product-contamination hazard by replacing immersion steam coils in its 10,000-gal. shortening tanks with external coil sections. Latter are tack-welded to the tanks' underside with special heat-conducting cement. Installation was engineered by Tranter Mfg. Inc., Platecoil Div., Lansing, Mich. **(208)**



"faster, faster, faster"

Instant fruit pie fillings *that do not have to be cooked*

A change has taken place . . . in preparing bakery fruit pies.

Fruit fillings are now made with National's INSTANT CLEARJEL, a precooked specialty starch. It eliminates cooking and cooling—and reduces preparation time to minutes. It also eliminates the prolonged stirring in steam kettles that formerly bruised and mashed the fruit—and adds the extra sales appeal of appetizing whole fruits and slices.

INSTANT CLEARJEL is only one of many National food starch specialties. Others withstand freezing and thawing; or meet exceptionally rigid standards; or prolong shelf life; or add gloss and sheen; to name a few.

National's full range of technical services include suggested formulas, technical information and imaginative experimental work. All are available to food processors.

A COLD SWELLING STARCH

Instant Clearjel®

FOR THICKENING FRUIT PIES

AVAILABLE FROM YOUR BAKERY SUPPLY HOUSE

National **STARCH and CHEMICAL CORPORATION,** 750 Third Avenue, New York 17, N. Y. • **Offices in all Principal Cities** in the United States, Canada, England, Mexico and Australia ☆ Maker of a broad line of Starches and Synthetic Resins for the Packaging, Paper and Textile fields.

INGREDIENTS

They provide many new opportunities for new-product development, product improvement, process economies

CITRUS FRUITS frozen in liquid nitrogen and processed into minute cells that retain the fruit's original flavor and nutrients . . .

An emulsifier that also acts as a food coating, film plasticizer, and equipment lubricant . . .

A corn syrup that can replace a part or all of a brewer's dry adjuncts, thus cutting peak production costs up to 35% . . .

These are but a few of the new or improved ingredients that can increase your processing efficiency, and improve the taste, appearance, and shelf life of your products.

Featured in this report:

Developments Briefed—Ingredient innovations and how you can profit from them.

From Commissioner Larrick—Where we stand on additives, what it will take to finish the job.

Natural Carotene—New high-potency source and latest processing techniques may cut its cost.

Dual-Conversion Corn Syrup—Offers special advantages in preserves, ice cream, candy.

Cellulose Gums—Form stable gels containing over 98% water. Many other uses cited.

Latest Starches—How they act as thickeners, fluidifiers, stabilizers, film formers.

New-Form Citrus Oils—Their special protective matrix guards against oxidation, flavor loss.

FE Staff

Developments Briefed

● **Liquid Corn Adjunct** ups beer production to meet peak summer loads, while curbing costs. Brewers report it provides extra capacity without expanding the brew house or adding shifts, also yields a high-purity product of excellent flavor.

Although slightly higher in cost than grits, concentrate can replace up to 100% of dry adjuncts. This boosts overall output some 35%, which more than offsets the higher ingredient cost. Current practice is to replace 10-20% of dry adjuncts.

Called "Nu-Bru," concentrate is metered into the wort at the brew kettle or at various stages beyond. Handling facilities include a heated storage tank, piping, pumps, and a flow-controlling meter. This provides a closed, sanitary system.—Corn Products Co. (336)

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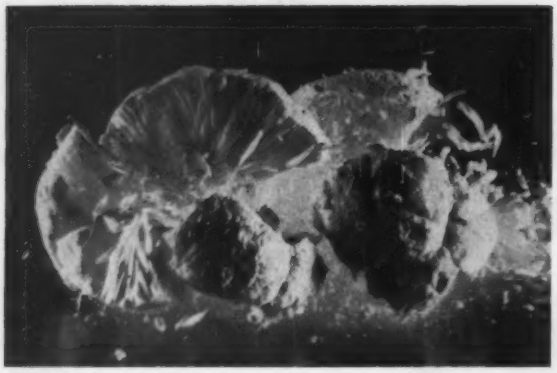


ON IMPACT, frozen orange shatters into flavor cells.

● **Natural Fruit Cells** are latest citrus flavorings for ice cream, sherbets, soft drinks, and confections.

In a process currently being perfected by Air Reduction Co., peeled orange or grapefruit is frozen in liquid nitrogen, then shattered into tiny cells. Latter are said to retain the flavor and nutritive value of the original fruit. **(340)**

● **Broad-Gage Preservatives** (pH range 3-8) inhibit mold and bacteria in foods in which acid preservatives and their salts have little effect.

Agents are derivatives of p-hydroxybenzoic acid, of which the methyl and propyl esters are approved for use in non-standardized food. Limit for each is 0.1%. Known as "Parasepts," they are white powders that impart no color or ordor, their activities are additive and they have anti-oxident properties.

Typical applications: Bakery, cheese, and fruit products; beverages and syrups; preserves, flavorings, salad dressing.—Heyden Newport Chemical Corp. **(337)**

● **Dehydrated Citrus Peel** is protected from oxidation by special processing that also retains natural flavor and nutrients.

Used in General Mill's Orange Muffin Mix, it provides shelf life otherwise unobtainable with ordinary peel—thus offers wide application in cake mixes, candies, maramalades, sherbets, and condiments. Product is called "Seel-Peel."

Similar processing of the albedo (white portion of peel) yields a neutral product that serves as carrier or matrix for other fruit flavors and colors. Its softness, absorbing qualities, and resistance to disintegration during processing offer bite qualities desirable in many foods.

In dehydration, citrus peel is vacuum-distilled with a non-aqueous syrup composed of glycerol and corn syrup-solids. The heat-transfer medium not only removes moisture from the peel, but replaces it with preserving syrup. Considerable peel oil is retained.—Sunkist Growers. **(338)**

● **Cellulase,** a standardized enzyme, derived from Aspergillus niger, depolymerizes such cellulosics as wood, barley gums, and soya bean hulls.

Typical application of the preparation, called "Cellulase 4000," is increasing the body of malt beverages by solubilizing more of the malt and cereal adjunts. Recommended concentration in the mash is 0.02-0.05% (solids basis). Used in processing of citrus juices and essential oils, it aids in extraction and clarification.—Miles Chemical Co. **(339)**

● **Edible Films** of pure amylose may result from a process that economically separates amylose from ordinary dent corn.

Such transparent films and coatings could be used for meats, especially sausage-type products; frozen vegetables, and specialty items. The cold-water-soluble starch fraction is called "Napol-L".—A. E. Staley Mfg. Co. **(341)**

● **Microcrystalline Cellulose** is new ingredient for scientific control of nutritive and caloric contents of a wide variety of foods—baked goods, frozen deserts, whipped toppings, spreads, dressings, sauces, etc.

Typical of qualities imparted by the ordorless and tasteless product, called "Avicel," are gel stability, bulk, texture, and palatability. It is classed as 'generally recognized as safe', thus is not subject to special additive clearance.

Smooth, easily spread opaque gels containing up to 15% of the calorie-free product can be made by proper mixing with water. In dry form, it can be used to convert syrups (molasses, honey) and oils or oil-based foods (essential oils, cheese, peanut butter) into free-flowing powders. Ingredients are simply combined at room temperature.

The product is now available in semi-commercial quantities.—American Viscose Corp. **(342)**

● **Instant Dough Developer** eliminates the sponge process. Thus, doughs can go from scaling to baking in 2 hr., with only 15-45 min. of floor time. Costs are cut by elimination of time, labor, and fermentation loss associated with the sponge process. Moreover, capital investment in troughs, hoists, and mixers is reduced, while floor space used for pre-fermentation can be reclaimed.

Known as "Reddi-Sponge," the developer is readily adapted to any yeast-fermentation dough formula. —Western Condensing Co. **(343)**

● **Hydolyzed Vegetable Proteins** in liquid, paste, or powder form, offer a clean 'meaty' flavor with no metallic background taste. Moreover, they have very low bacteria count.

One series (4BE) may replace beef extract at a ratio of 1.66 to 1 for the extract. It is recommended for soups, all meat products, steak sauce, frozen beef pies, and meat gravies. Another group (3H) has proved valuable in veal, pork, fowl, vegetables, and seafood products.

The high MSG content of the hydrolysates, known as "Maggi," permits reduction of MSG in many formulas.—The Nestle Co. **(344)**

● **Glucono-Delta-Lactone,** a versatile acidulant for chemically leavened baked goods, hydrolyzes to form gluconic acid—slowly in cold water, but faster at higher temperatures.

Thus, little carbon dioxide is formed during batter preparation. Main release of gas occurs during baking, as desired. The acidulant may be coated with calcium stearate for greater stability in hygroscopic mixes.

When used in foods prepared by deep-fat frying, it reduces fat absorption by 7-10%.—Chas. Pfizer & Co. **(345)**

● **Safflower Oil**—highest in linoleic acid content of any commercially available oil—provides a maximum of this essential fatty acid per calorie. Thus, it is of special interest in view of the current accent on unsaturates.

For more data, circle item numbers on Inquiry Card, back of book

Its principal application is as an ingredient of margarine, mayonnaise, salad dressing, imitation ice cream, peanut butter, specialty breads, and reconstituted milk. It may also be used as a salad oil, and for frying (smoke point, 475F).

Product has a neutral, bland flavor that permits its use wherever liquid oil is suitable. Storage stability is at least a year without refrigeration.—Pacific Vegetable Oil Corp. **(346)**

● **Versatile Acetylated Monoglycerides** may be used as food-coating agent, emulsifier, packaging-film component, and equipment lubricant.

Known as Myvacet, the monoglycerides are available in three types to cover the range of applications. FDA approves their use in concentrations up in 5% in finished foods.

They offer edible protective coatings for frozen and processed meats, poultry, frozen fish, dried fruits, nuts and candies. Poultry and meat applications may require further USDA clearance. Coatings can be eaten with the food or simply washed off prior to cooking.

The agent also enhances the emulsifying properties of fats used in baked goods, icings, and confections. In packaging films, it acts as an edible plasticizer.

As an edible lubricant, it serves as a release agent for a variety of food-processing surfaces — pans, slabs, molds, etc. — Distillation Products Industries. **(347)**

● **Sodium Erythorbate** in bacon cures aids initial development of cherry-red color, also offers reasonable extension of color stability at point of sale.

By its reducing action on nitrate and heme-pigments of meat, it cuts curing time and effects maximum color fixation. At point of sale, residual agent in the finished product retards oxidation or fading of the cure color.

Called "Nea-Cebitate," it may be applied in the pumping pickle, by the cover-pickle process, or by dry cure. For optimum effect, however, each technique must provide a residual concentration of 200-300 ppm. in the lean.

Cost of the agent ranges 7-14c./100 lb. of finished bacon, depending on use level and curing procedure. —Merck & Co., Inc. **(348)**

● **Dry Spice Seasonings,** prepared from essential oils and/or oleoresins, are offered as effective substitutes for their natural spice counterparts.

Special spray drying entraps the individual oil globule in a protective colloid that guards against oxidation and flavor loss. Particles are then blended with dextrose or salt to yield a dry-powdered product.

Known as Spisoseals, the seasonings are readily dispersible in dry or liquid medium. Typical applications: Cake, soup, and sauce mixes; salad dressings, and pickles.—Dodge & Olcott. **(349)**

● **Dry Fermentation Flavor** instantly imparts yeast-leavened flavor and aroma to chemically leavened baked goods. Thus, its use eliminates time-consuming dough fermentation.

Applications of product, called "Vico 400," include breads, biscuits, sweet goods, waffles, pizza shells. —Vico Products Co. **(350)**

● **Liquid Shortening** cuts production costs by eliminating time-consuming scooping of shortening.

Called "Fluid Flex," it can be handled by any bulk-liquid system, and may replace emulsifier shortening in all bakery products except cream icing.—Durkee Famous Foods. **(351)**

● **High-Protein Supplement,** a soybean derivative made bland by special processing, offers economical means for fortifying baked goods, prepared meats, etc.

Known as "Promax," it ranges 70% protein, 4.2% lysine.—Griffith Laboratories, Inc. **(352)**

● **Oil-Soluble Annatto Colors** impart natural tints ranging lemon yellow to orange-red.

Products are pre-weighed and scored for convenient use in any fat or fat-containing food. One type (A-500) contains annatto in a vegetable oil base, the other (AT-250) includes turmeric.—Chr. Hansen's Laboratory, Inc. **(353)**

● **Dry, Pre-Cooked Fondant** offers bakers and confectioners the desirable qualities of prepared fondant without the inconvenience of handling a plastic mass.

Called "Dri-Fond," it simplifies production of smooth, glossy icings; also enables pan-coating of cordial cherries and candies. — American Molasses Co. **(354)**

● **Ice Cream Stabilizers,** containing lecithin, control crystallization, maintain optimum dispersion of air bubbles and flavorings, and act as anti-oxidents.

Known as "Instant Lecithinated Stabilizers," they can be metered for continuous production.—American Food Laboratories, Inc. **(355)**

● **Salt Substitute**—enhances the flavor of low-sodium foods without increasing their sodium content.

Called "Neobakasal," the seasoning is used at less than the usual rate for salt. In bread baking, for example, this might shorten dough fermentation and proofing time.

FDA regulations require appropriate label declaration of ingredients.—Sterwin Chemicals, Inc. **(356)**

● **Standardized Oleoresins** conforming to Federal Specification EE-S-645 may, when extended, replace the natural spice pound for pound.

In general, products are combinations of the true oleoresin and the corresponding essential oil. Called "Superesins," the line includes virtually all oleoresins of interest to food processors.—Fritzsche Brothers, Inc. **(357)**

● **Shrimp and Lobster Powders** are termed excellent flavorings for soups, spaghetti and meat sauces, also cocktail and cheese spreads.

Derived from the respective seafoods, products contain added spices to produce distinctive flavors. They are used at the rate of 4-8 oz. per 100 lb. of product.—Norda Essential Oil & Chemical Co. **(358)**

● **Nutritive Glazes** for nutmeats and confections retard rancidity and moisture pickup.

The plasticized protein coatings, called "Cozeen," consist primarily of zein (corn protein) and mono and diglycerides of edible fats in an alcohol solvent. Products may be applied either by panning or spraying.—Al-Chem Laboratory **(359)**

GEORGE P. LARRICK
Commissioner,
U. S. Food and Drug
Administration

Exclusive from

Commissioner Larrick:

"Let's Finish the Job!"

FDA Chief reports on additive progress to date, what remains to be done—and how

WE HAVE COME a long way toward accomplishing the initial purposes of the Food Additives Amendment. The law now assures the safety of new food additives.

But screening our food supply for additives in use before Jan. 1, 1958 has taken longer than we estimated. The number of substances involved is several times larger than we had supposed. And it has taken industry longer than we expected to assemble data for determining the status of many substances under the law.

Moreover, our administrative procedures have taken longer than we had hoped.

Most of the food industry have acted in good faith and as promptly as possible to get clearance for their additives or to determine whether clearance is required. Pharmacological testing requires a certain minimum time, hence our request to the Congress for extension of the effective date of the law under certain conditions. That authority was granted in the bill signed into law on Apr. 7.

But it is only the authority to extend that is granted by the law. The law does not of itself grant any further extension.

Our mail from the public indicates greater concern now over the long-term safety of our food supply than ever before, despite the added protection of the Food Additives Amendment. In answering this mail, we explain the safeguards provided in the Pesticides, Food Additive, and Color Additives Amendments, and our programs to see that the new safety rules are observed. We must also explain, however, the respects in which the new law is not yet fully operative.

We sense a great and growing impatience with any continued use of substances not affirmatively shown to be safe, or of undetermined potentiality for getting into the food.

Such continued use is regarded by many of our correspondents as a negation of the protection they were promised by the 1958 Act. The reaction of these correspondents is something like this:

"So it takes a long time to do the testing to show an additive safe. Even without a law, industry should have shown the product safe before it was used. Why should we be the guinea pigs while tests are being made on the rats? If the substance is still not proved safe, let them stop using it until it is."

The logic of this point is irrefutable! And it must be met with action and policy equally sound.

It will be our purpose to use the extension authority which has been granted only for good cause and under circumstances which do not warrant consumer apprehension as to the safety of continued use during the extension period.

Policy Clarified

The requirements of the Act as amended, the regulations, and our policy with respect to further extensions for additives or substances which may be additives may therefore be summarized as follows:

1. No extension can be granted for any substance in use prior to Jan. 1, 1958 unless an extension was in effect (or a request pending) as of Mar. 5, 1961.

2. No request can be granted unless steps to determine the applicability of the Food Additives Amendment were taken prior to Mar. 6, 1960.

3. Previously granted or pending extensions will be continued in effect until July 1, 1961 (unless a regulation specifying otherwise or a denial of a pending request is issued before then) to enable submittal of the necessary information, and its evaluation by FDA, on substances for which a further extension is requested.

4. No extension beyond July 1, 1961 will be granted unless the substance is shown to present no undue risk to public health during the extension period.

5. Requests for extension beyond July 1, 1961 must include:

a. The specific name (not trade name) or chemical name of the substance, use or uses for which an extension is requested, and the amount and purpose involved in each usage.

b. Details of actions taken, and when, to determine whether the substance is an additive. If so, whether it is safe for each use, with results to date.

c. Nature of additional work in progress, by whom being conducted, and results to date.

d. A statement of the additional time needed to determine whether the substance is a food additive, or to submit a petition to FDA.

6. Any extension granted beyond Jan. 1, 1962 will be conditioned upon a requirement that a progress report be submitted at 6-month intervals.

7. No extension can be granted beyond June 30, 1964.

With these safeguards, we can tell consumers that the Food Additives Amendment is operating for their immediate and ultimate protection.

But the sooner the status of all potential additives can be determined, **the better for** all concerned—the food industry, the consumer, and FDA.

Let's get on with the task. Let's finish the job!

New Techniques Offer Lower-Cost Natural Carotene

High-carotene source and latest unit operations widen potential uses of versatile ingredient

R. C. MOSHER
N. Long Beach, Calif. President, Barnett Laboratories, Inc.,

STRIKING ADVANCES in carrot growing and processing now assure a plentiful and relatively economical supply of natural carotene.

Processors of margarine and shortening use carotene as a natural coloring agent and for vitamin A enrichment. Moreover, the product is finding wide application in baked goods, such as sweet rolls, doughnuts, and cakes; citrus beverages, and popcorn oil—principally as a colorant.

Easy to use because of its concentrated form, it usually is mixed into margarine and shortening before hydrogenation, and into citrus beverages when extracts, sugar, etc., are blended. For baked goods, carotene often is incorporated with the shortening when the latter is mixed into the dough.

Carotene is readily soluble, has high stability, and does not adversely affect the stability, odor, or flavor of foods.

New Carotene Source

At Barnett Laboratories, we process up to 1,000 tons of carrots a month—a sizable increase over the few hundred pounds a day handled less than 25 years ago. Accordingly, the price of carotene has dropped more than sevenfold.

Our breakthrough came just a few years ago, when we learned of a European strain of carrots with more than twice the carotene content of those supplied by our selected growers. A minor drawback was the fact that the new strain took twice as long to mature as ordinary table carrots.

However, with adequate supply of the new seed variety and improved processing techniques, we have doubled our production rate of five years ago.

Here is the process which, we feel, includes some unusual filtration and drying techniques.

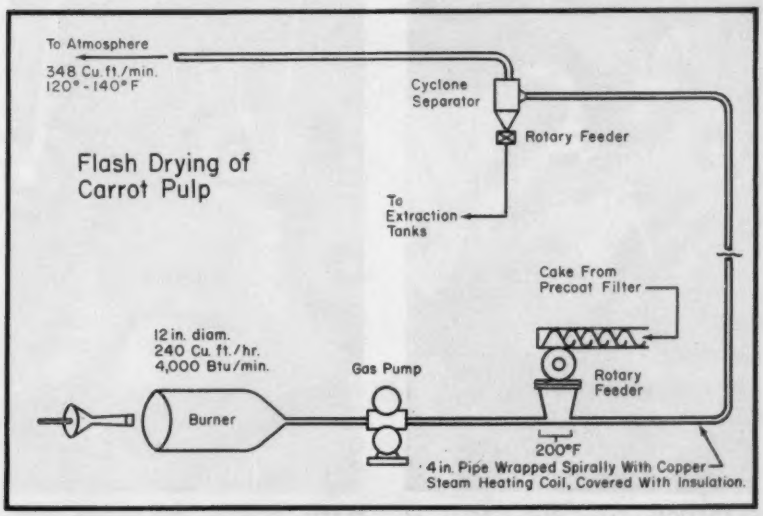
Pulp Extraction

Our plant covers some 6,000 sq. ft., including a separate final solvent-extraction section. Raw carrots are delivered in open trailers and held in open-yard storage. Only enough for a maximum of 3 days' processing is kept on hand, principally to insure freshness at time of processing.

Raw carrots enter the processing system through a conveyor equipped with water washing sprays. It discharges into the first of two Rietz disintegrators in series. The first, an angle type, has screen openings of 1/16 in.; the second, a vertical type, has .023 in. openings. The resulting finely ground pulp is picked up by Moyno pumps and sent over three Oversstrom differential oscillating screens in series for counter-current water washing. A fourth 'polish' oscillating screen is also used for maximum removal of pump solids.

Screened-out pulp is sent to a screw-type 'foots' press where it is dewatered and emptied into a storage tank. This byproduct is sold to dairies as fresh feed, which is used as a conditioner in lieu of green forage.

Liquor from the polishing screen carries the desired carotene in colloidal suspension, along with a small amount of sugar in solution. It is pumped to a 2,000-gal. treating and storage tank, which is equipped with a heat exchanger. Heating the liquor facilitates sub-



MOIST CAKE from rotary filter is fluidized and dried to 15-20% moisture in a hot-air stream. Cyclone recovers product.

sequent filtration, a critical processing step.

Reverse Filtration

The filter is a Dorr-Oliver rotary vacuum precoat unit. Of stainless steel, the 8x8 ft. filter uses Dicalite Special Speedflow diatomite filteraid. Considerable investigation was necessary to select the proper grade.

Based on the test data, we selected the most efficient grade of filteraid, as well as the optimum precoat thickness, drum speed, and knife cut for our particular operation. Since the carotene is suspended in the liquor, we employ what might be termed 'filtration in reverse.' Our interest is almost entirely in the colloid solids filtered out of the liquor.

To begin a filtration cycle, a 5% slurry of filteraid in clear water is used to precoat the drum to a thickness of 1¼-1½ in. Speed of the drum during precoating is 4-4½ rpm., and we have no trouble with cake cracking. Precoating usually takes 45 min. and requires 700 lb. of filteraid.

An advantage of this particular filteraid is that it precoats uniformly. We need not waste filteraid pre-cutting the cake to obtain an even surface along the entire width of the drum, although for the first few drum revolutions the knife cut is deeper than average for the cycle.

From 10 Gm. of Carrot Seed

When news of a high-carotene strain of carrots reached Barnett Laboratories a few years ago, it spent 18 months tracking down the seed. Twenty grams of seed were finally located in Holland, of which half was planted for seed increase, the rest allotted to laboratory tests.

Now, the supply is adequate for 18-20 months of planting and an average of 300 acres is cultivated continuously. Production and uses of carotene are detailed in the feature article.

Chemically, carotene is a chain of complex groups each containing two molecules of vitamin A. The animal body (including human) has the unique capability of splitting the carotene molecule to make two molecules of vitamin A available.

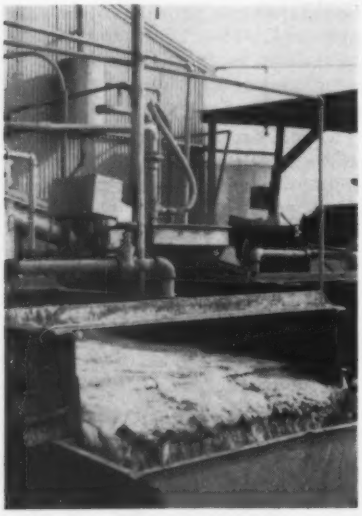
Crystalline carotene, produced at the company's modern plant at North Long Beach, Calif., contains 20% alpha type and 80% beta. It is supplied as dry crystals or in microcrystalline form suspended in vegetable oil (Patent No. 2,477,928). Vitamin A potency ranges 1,800,000 to 612,000,000 USP units per pound in seven standard grades. Price, based on Vitamin A potency, ranges 80c. to $90 per pound.

Liquor fed to the filter tank begins the operating filtration cycle. As the drum rotates, part of its circumference is submerged in the liquor tank. Applied vacuum pulls the liquor through the precoat and leaves the carotene solids as a relatively thin film which just penetrates the surface of the precoat. The blade is set to cut just deep enough (averaging .005 in.) to slice 90% of the solids and leave a fresh filtering surface on the cake.

Excessive cake penetration is not a problem, and operations go smoothly since there is virtually no variation in the process liquor from day to day. Filter cycles average 8½ hr. in 10 hr. shifts. Liquor throughout the peak is 50-60 gpm., according to plant demand. Virtually 100% of the carotene content of the liquor is filtered out and remains in the cake.

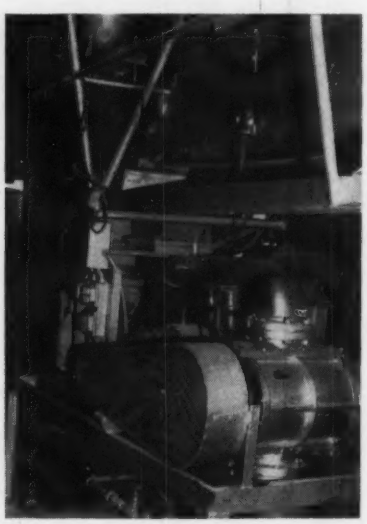
Fortunately, clear effluent from the filter offers no disposal problem. We find that cycling back up to 50% (according to operating condition) of this effluent into the filter feed improves filtration. The remainder is accumulated in a storage tank and periodically concentrated in a single-stage evaporator into a crude molasses, which is sold as a cattle-feed additive.

A 6-in. belt running the length of the filter catches the cake as it is shaved off the precoat surface. This belt discharges into a screw conveyor 6 in. dia. and 2 ft. long. It drops the cake through a 5-in. Sutorbilt rotary feeder (seal valve) into our special dryer.



PULP WASHING: Oscillating screens, such as this, separate carotene suspension from carrot pulp.

FILTRATION: From doctor blade of rotary vacuum unit, cake drops into screw conveyor.



FLASH DRYING: Carotene cake is dried in a hot air stream, ready for final solvent extraction.

Unique Flash Dryer

This unit was custom-built for our purpose. In its design and construction, we were materially assisted by D. F. Dyrsmid, Chief Engineer, Mining and Mineral Products Div., Great Lakes Carbon Corp.

As shown in our diagram, heat is supplied by a 4,000-Btu. per min. gas burner ahead of a 360-cfm. blower. Temperature of the air stream leaving the blower averages 200F.

As cake enters the dryer through the seal valve, it is picked up by the hot air stream and dried in transit through 350-ft. of 4-in. pipe which carries it to the solvent-extraction section. Entire length of this pipe is wrapped with a steam heating element, and covered with a thermal insulation to prevent heat loss. Exit temperature of the air at the end of the pipe is 120-140F.

This comparatively simple drying system has operated very satisfactorily for three years. Its capacity is about 500 lb./hr. of filter cake, which has some 50% moisture entering the dryer. This is reduced to 15-20% before cake is discharged into the solvent-extraction system.

Here, the conveyor pipe from the dryer discharges through a Ducon cyclone-type separator, which is also heated and insulated in the same way as the conveyor pipe. Air exhausts to atmosphere and cake drops through another 5-in. rotary feeder directly into one of three extraction tanks.

Solvent Extraction

When a tank is full, hexane solvent is added slowly. Percolating down the filteraid cake, it leaches out the carotene. This requires about 12 hr. for each tank charge, which averages 1,000 lb.

Liquor from the extraction tanks, with hexane carrying the carotene, goes to underground storage tanks. Next step is vacuum distillation to recover the solvent. A concentrate is left, consisting of partially crystallized carotene and a small percentage of natural vegetable oil from the raw carrots. Later processing separates the crystalline carotene.

In crystalline form, carotene is highly sensitive to oxidation. Therefore it is stored in inert gas, after air is evacuated from the container, or is suspended in edible vegetable oil. (End)

Dual-Conversion Corn Syrup

Much higher in maltose and lower in dextrose than regular corn syrup, it offers unusual resistance to undesirable color formation, moisture absorption, crystallization

RADICALLY CHANGED in carbohydrate distribution, a new corn syrup offers a variety of foods exceptional resistance to undesirable color development, moisture pick-up, and crystallization.

Thus, it provides many advantages for processors of jams, jellies, ice cream, and a wide range of candies—from the hard variety to starch jellies, caramels, fudge, and marshmallows.

Made by a dual-conversion process, the syrup is much higher in disaccharide content and lower in solids of intermediate molecular weight than conventional corn syrups. For example, 45% of its total solids is maltose, which is unusually high for a 42-43 DE syrup.

New Syrup's Analysis: High in Maltose, Low in Dextrose

	Dual-Conversion Corn Syrup	Regular Corn Syrup
Baume	43	43
Dextrose Equivalent	43	43
Carbohydrates Dextrose	4.7	15.5
Maltose	35.7	11.5
Solids, %	80.3	80.3
Viscosity, c/p (100 F.)	14,500	14,500
Ash, %	0.3	0.3
pH	4.7-5.1	4.7-5.1

The product, known as Mor-Sweet, is available from Corn Products Sales Co., New York City.

Resists Browning

Low dextrose content gives the syrup special resistance to color development during heating — especially important in processing of jams, jellies, and candies where product brilliance and clear colors are required.

Moreover, the syrup's resistance to the browning reaction opens new fields of application.

Its high maltose content, on the other hand, produces hard candies with greater resistance to high humidity than those made with regular acid-converted syrup. Higher pH levels can be used when processing with the new syrup, thus significantly less hygroscopic invert sugar is formed from sucrose during boiling. These factors extend storage life of the candies appreciably.

Various types of hard candies made with both types of syrups were stored in identical test containers at room temperature. After two months or longer, pieces made with high-maltose syrup rolled freely in the container, while those made with regular corn syrup stuck together.

In further tests, similar samples were cycled through relative humidities of 50-90% and temperatures of 90-120F. Under these conditions, too, candies made with the new syrup held their original color and form appreciably longer.

Finally, the syrup's ability to inhibit crystallization maintains desirable texture in candy, ice cream, and preserves. (End)

"LUMP OF WATER," a CMC gel, can be cut with a knife.

CMC: Versatile Gel Former

Among its many functions, carboxymethylcellulose (CMC) forms stable gels containing over 98% water

CONTROLLING the flow properties of foods is a prime application of cellulose gum (CMC), the sodium salt of carboxymethylcellulose.

Thus, aqueous solution of the same gum concentration can be given a wide range of viscosities. And gels containing 98% or more of water can be formed with stiffness ranging soft to rigid.

In practical application, the entrapped water would contain solids in solution or suspension. Rigid gels of good texture have been made from 50% cane-sugar solutions.

How Gels Are Formed

One technique depends on carefully controlled addition of a gelling agent to CMC solutions. A food-grade basic aluminum acetate salt is preferred because it liberates aluminum ions slowly and imparts no applicable color to the gel product. Such gels have been stored over two years without discoloration, change in stiffness, or syneresis.

How the gelling agent is added to the CMC solution is critical because a polyvalent cation, such as aluminum, will precipitate CMC if the ion attains sufficient concentration.

Gel texture, stiffness, and speed of gelling can be controlled by varying the concentration of gum, its viscosity type, and the amount of aluminum acetate used. The latter is sparingly soluble in water, thus liberates aluminum ions at a sufficiently low rate to effect cross-linking rather than precipitation of the gum.

Results of tests performed by Hercules Powder Co., Wilmington, Del., are tabulated below. Gels were classified as soft, firm or rigid on this basis: A rigid gel holds its shape more or less indefinitely, a soft one flows slightly, and a firm gel is intermediate.

Tests 1, 2, and 5 show how varying the concentration of gum affects the gel character. How availability of aluminum ions influences gel stiffness is shown by tests 2, 3, and 4. Comparison of tests 1 through 5 with those 6 through 9 illustrates the effect of the gum's viscosity type.

Note, too, that 0.2% CMC is the lowest concentration at which significant gelling occurs, and that 7% of aluminum acetate (based on weight of CMC) is the minimum effective quantity.

Retarders are often useful in preparation of gels when the too-rapid availability of aluminum ions precipitates the gum. Anions such as acetate, tartrate, citrate, and phosphate exhibit this property by complexing aluminum ions. However, high concentrations of these anions must be avoided or they will prevent effective cross-linking of the gum molecules.

(End)

HOW Ingredient Variables Affect Gel Character

Experiment Number	Viscosity Type CMC	Concentration of CMC, %	Aluminum Acetate, % (on CMC)	Kind of gel	Time to gel, hr.
1	7H	1.0	20	rigid	1-½
2	7H	0.5	20	rigid	2
3	7H	0.5	15	firm	4
4	7H	0.5	7	soft	24
4a*	7H	0.5	7	soft	1
5	7H	0.2	20	soft	4
6	7M	2.0	15	rigid	2
7	7M	1.5	7	firm	4
8	7L	4.0	20	rigid	2
9	7L	2.0	20	rigid	3

*pH of CMC solution reduced to 4 with hydrochloric acid.

Many Uses for CMC

In starch products: Combines thickening and water-binding actions to curb syneresis in pie fillings, puddings, etc.

Frozen foods: Stabilizes syrup coatings on frozen fruits to inhibit bleeding, also increases the freeze-thaw stability of thickened products.

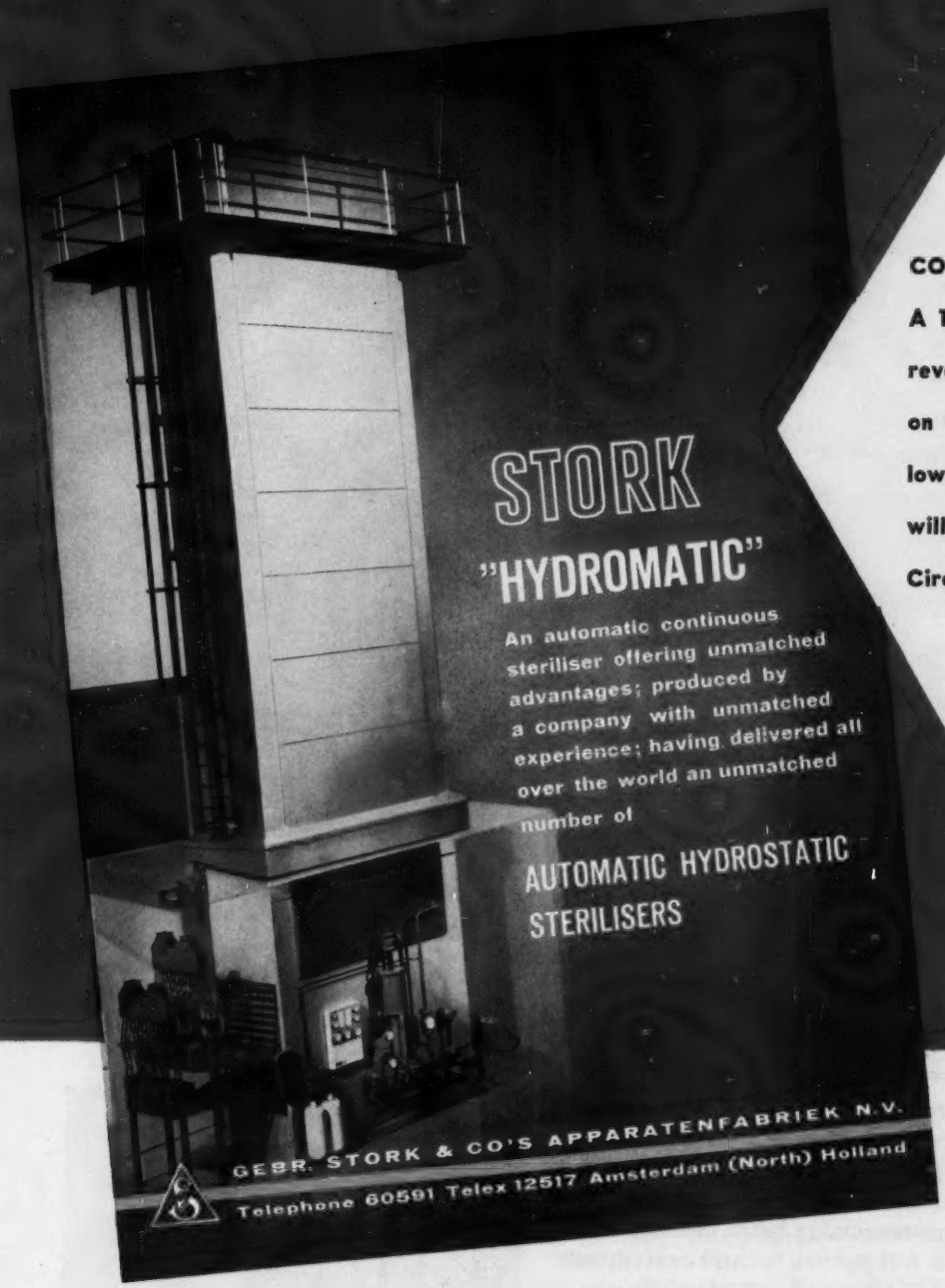
Ice Cream and sherbets: Inhibits formation of ice crystals to improve product texture and keeping qualities.

Icings and frostings: Retards growth of sugar crystals, also curbs dehydration and weeping.

Dehydrates: Aids reconstitution of fruit or vegetable juices and dry soup mixes, also improves their texture and palatability.

Salad dressings and toppings: Acts as an emulsion stabilizer.

Additional CMC applications: Inhibiting agglomeration and settling of fine particles, as in chocolate milk; curbing absorption of fat during frying of doughnuts; imparting body to dietetic foods; and improving the score and shelf life of cakes.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Whether you use round, square or irregularly shaped cans, lithographed or labelled, one Stork Sterilizer may handle your entire production, or at least very nearly so. Special sterilizers effect automatic rotary sterilization the "safe and efficient hydrostatic way"

Due to weatherproof construction, Stork Sterilizers require a building no more than 10 ft. high. Floor surface required: about 80 sq. ft. Then, of course, enormous savings on steam (70%), and water (80%) may also cure peak-load problems on steam raising and water disposal. We would appreciate the opportunity to send you the facts.

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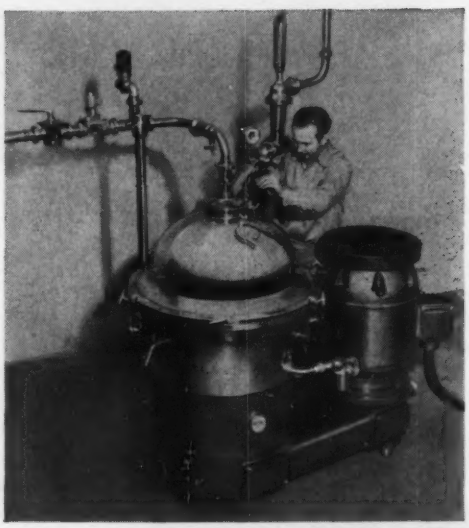


Used to control pulp solids concentration in orange juice, "Big Sam" Automatic De-Sludger in all-sanitary design (Model SAMN-15037) has found wide acceptance in Florida citrus industry. Similar installation is part of unique orange juice processing system developed by Minute Maid Company now in operation at Minute Maid's Plymouth and Leesburg, Fla. plants.

Latest Starches —How They Are Used

Each application calls for special properties of the starch molecule—often acquired by physical or chemical change

O. B. WURZBURG,
Assoc. Director of Research, National Starch and Chemical Corp., Plainfield, N. J.

UNIQUE in its versatility, starch to some processors is an inert powder, to others a thickening agent, and to still others a binder.

In some instances, these properties are inherent in native starch, but often they are acquired through physical or chemical modification. In any case, characteristics of value to the food processor are associated with one or more of starch's four basic facets:

1. **The dry granule or powder.**
2. **The swollen granule.**
3. **Starch molecules in solution, and**
4. **The dried film.**

In considering these states, we will relate starch properties and applications—both actual and potential.

Granules and Powder

Large surface area and digestibility of starch granules and powders are major factors in their use as: A diluent for active ingredients, such as flavorings; a fluidifying agent in confectionery sugar; a dusting powder; and, as a means of keeping two or more active materials physically separated, as in baking powder.

Starch granules have an affinity for moisture which, as shown in Table I, depends on the starch type, relative humidity, and temperature.

Powdered corn starch usually is packed at about 11% moisture, thus can absorb moisture at high humidities. To increase this capacity, it is frequently dried to 7½%, 5%, or even 1½% moisture, and sold in vapor-proof bags. At these low-moisture levels, it can extract moisture from other materials and guard them against moisture-induced deterioration.

This property of high surface area and the ability of starch to absorb moisture governs the use of dry starch as a diluent in baking powder and as an additive to confectioners' sugar.

Another pertinent starch property is 'mobility,' or ability to flow. This, too, is increased by drying. By coating granules with very finely divided powders, such as magnesium oxide and aluminum hydroxide, dry-powder mobility can be further increased.

A more effective technique, however, is to bond hydrophobic groups to the granule surface chemically. This provides a powder which is not only extremely mobile, but in certain instances highly hydrophobic.

One such product, called "Dry Flo," is not wetted by water, yet retains the capacity of the parent starch to absorb moisture. It extends the usefulness of starch as a diluent, fluidifying, or processing aid by absorbing much more moisture than could ordinary starch without losing its fluidity.

However, the product is not being recommended to food processors until FDA issues a regulation covering its use in foods.

Starch granules, on the other hand, may also be modified so they will not be mobile. By spraying them with a small amount of mineral oil, they can be ground to a powder that packs very easily and accepts an impression to form a mold. Thus, starch is used as a molding powder in manufacture of gum candies, where it serves not only to form the mold but to remove moisture from the candy. And this hastens the setting process.

Swollen Granules

Properties of the highly swollen granule are used extensively when starch is employed as a thickening agent or stabilizer. The salve-like consistency and relatively high viscosity of swollen granules are responsible for their use in salad dressings, pie fillings, gravies, canned foods, etc.

Raw starches are not particularly suited for these applications

TABLE I

Equilibrium Moisture Contents of Various Starches at 72F.

STARCH	Relative Humidity (%) 90	70	40	20
Potato	29	21	15	10
Corn	24	18	13	10
Tapioca	25	19	14	—

About Starches

Starch is deposited in tubers, roots, or seeds of plants in the form of minute granules or cells, their size and shape depending upon the particular plant source. One pound of corn starch contains about 700 billion granules, which provide surface area of 4,000-5,000 sq. ft.

Polymeric in nature, starch is a polysaccharide whose basic glucose units are linked through glucosidic linkages with elimination of water. Each molecule contains one terminal reducing group.

Two types of polymers are found in starches. One is amylose, a linear or straight-chain polymer. The other is amylopectin, a branched polymer considerably larger than amylose. Both polymers contain many hydroxyl groups, which are capable of associating by means of hydrogen bonding.

In dissociated form, amylose and amylopectin disperse in hot water to form sols. On cooling, however, amylose molecules tend to associate by hydrogen bonding. In dilute solution, this results in formation of large complexes of two or more molecules which lose their solubility characteristics and precipitate from solution. At high concentrations, they form rigid networks in which water is entrapped, giving a gel-like structure.

Amylopectin, however, has little tendency to associate. The granule is insoluble in cold water, but heat weakens the forces holding it together. The molecules thus exert tangential pressures that swell the granules. During the process, the aqueous suspension thickens and its clarity increases. Eventually, the granules collapse, suspension viscosity drops, and then levels off at some equilibrium valve.

As this loss in viscosity occurs, rheological properties of the dispersion change from those of a highly thixotropic pseudo plastic system to a more Newtonian type.

because their granules may show widely varying susceptibility to swelling. Moreover, they generally are too fragile to heat, chemical conditions, and mechanical shear. To overcome this, the granule is toughened by supplementing the normal forces responsible for the granule structure with additional physical or chemical crosslinking bonds.

Depending upon degree of treatment, granules can be modified over a very wide range from types in which the granule has been toughened only enough to delay rupture, to those toughened to the point where they will not swell in boiling water.

Corn starch contains 28% amylose. When its granules are used in the swollen state, the amylose within them and the surrounding aqueous medium will associate. This decreases the clarity of the sol and imparts a gel structure. Continued association takes place with time between not only amylose fragments, but probably the outer branches of the amylopectin. As this occurs, the sol loses its water-holding capacity and syneresis or weeping occurs.

This effect is particularly exaggerated at near-freezing temperature. To minimize it, waxy starch types which are essentially all amylopectin have been developed. They show greatly improved stability and clarity but, at low temperatures, may lose hydrating capacity with extended aging.

Two new starches have recently been introduced to overcome this effect. They are an Amioca, or waxy corn-base product, and a tapioca type in which the tendency of the amylopectin portion to associate has been greatly reduced. Thus, they may be held almost indefinitely at near-freezing temperatures without change in the swollen granules.

These products are finding increased acceptance in canned and frozen foods.

Dissolved Molecules

How starch molecules act in solution is important in processing of gum candies.

In this case, the granule is ruptured with release of amylose and amylopectin. The amylose then associates, forming a rigid network which is responsible for the desired set or gel.

Strength of such gels can be varied over a wide range by altering the size of the molecule, the ratio of amylose to amylopectin, and by eliminating impurities which control the gelling tendency of the amylose fraction. Products which form clear soft stable gels, as well as strong, tough gels, are available.

For example, there is a recently developed high-amylose hybrid corn starch containing 55-60% amylose. It is very difficult to disperse and requires cooking temperatures well above 221F. However, once cooked, its dispersions show remarkable gel strengths varying up to 10 times those of conventional starches.

Starch molecules are also capable of acting as stabilizers to collodial systems and as emulsifiers. In salad dressings, starch emulsifies the vegetable oil. Certain modified starches are used in encapsulation of oils by spray drying. A prerequisite of the modified starch in this process is that it act as an emulsifying agent for the oil prior to spray drying.

Through introduction of hydrophilic and/or hydrophobic groups, it is possible to improve the emulsifying properties of the dispersed starch molecules significantly. Modified starches with excellent emulsifying properties have been produced this way.

Starch Films

Ability of starch dispersions to form films and of binding particles together, or to a substrate, is the fourth major characteristic.

Strong and tough edible films could open the door to a wealth of new and interesting applications. These include edible surface coatings on foods, edible food packets for prepackaged mixes, sausage casings, improved binders, etc.

A starch dispersion may contain molecules of amylose and amylopectin, aggregates of these molecules, and swollen and ruptured granules in water. As the water evaporates, they interlace to form a network which may

TABLE II

Strength of Starch Films

STARCH	Tensile Strength (Psi)
Amioca	2,500
Corn (27-28% amylose)	5,000
Amylose	10,000

produce a film. Or if resting on a surface which has an affinity for starch, the network may bond itself to that surface.

This has led to the use of starch as binding and coating agents.

Research in this area is directed primarily toward improving adhesion and film strength as well as ease of application. Molecules in raw starch generally have the best adhesive strength. However, large amounts of water are required to disperse them, and this water must subsequently be removed before a film is produced or bonding can take place.

To avoid this, techniques have been developed for making the molecules smaller so they will not require so much water and, hence, can form a film or produce a strong bond much more quickly.

Strength of a film is a function of size and shape of the polymeric molecules. In general, linear polymers will give stronger, tougher, and more flexible films than branched ones. This is because they orient more readily and form intermolecular bonds. On this basis, one would expect amylose to give stronger films than amylopectin.

It is possible to separate the two polymers in starch by a complicated procedure. Films of pure amylose are much stronger and more flexible than those of amylopectin, which are very brittle (Table II). Real advances in film quality will come when ways are found to isolate amylose from amylopectin, and put it in an easily used form. This problem is being studied in our laboratories.

Two approaches are being taken. One is separating the amylose by fractionation of starch. Amylose obtained by this method is in a strongly associated form which is not readily utilized.

The other approach is genetic. This involves development of a hybrid starch which contains a very high percentage of amylose. Development of an all-amylopectin starch was accomplished this way. Going in the opposite direction, however, is more difficult.

We have now reached the 55% amylose level on a commercial scale. Eventually, we hope to develop starches with 80 - 100% amylose. (End)

Ingenious Process Guards Citrus Oil Quality

New technique entraps oil globules in matrix of corn-syrup solids—thus curbs flavor loss and oxidation

CITRUS OILS are now protected against flavor loss and oxidation by special processing that 'locks' the oil in an edible amorphous matrix.

The solid flavorings, which are in granular form, were developed by Sunkist Growers, Inc., Ontario, Calif. Called "Perma-Stabil," they can be used wherever a water-dispersible citrus flavor is desired.

Volatiles are entrapped as microscopic oil globules in a matrix of corn-syrup solids. The flavor is released only when the product is dissolved. Typical applications include flavoring of dehydrated orange or lemon juices, or ades.

The granules also offer interesting possibilities for flavor variation. For example, a more natural piquant grapefruit-flavored beverage can be produced by preparing the grapefruit-oil flavor with a small amount of the grapefruit's bitter component, naringin.

Moreover, individual 'locked in' flavors can be mechanically mixed to solve the problem of stabilizing flavor blends that otherwise would not be compatible because of chemical interaction during storage. A case in point is blending orange oil and methyl anthranilate.

Being hygroscopic by nature, the granules (and the foods they flavor) must be stored in hermetically sealed packaging to prevent moisture pickup and resultant caking.

Here are details of the new product's development, production and properties.

Two-Step Technique

Many substances have been used or proposed for 'locking-in' essential oil flavors—gelatin, vegetable gum, sorbitol, and mixtures of sugars. Primary reason for failure of most of them has been storage changes in the metastable matrix that permit escape of volatile oil or allow its oxidation.

Corn-syrup solids, however, when properly plasticized with the flavoring, yield a product that remains permanently amorphous under adverse storage conditions.

The syrup found most useful has a dextrose equivalent of 42 and consists of 22% dextrose, 21% maltose, 37% dextrins, and 20% higher saccharides. At 3.5% moisture, it has a flow point of 121C.

Although essential oils high in terpene are difficult to disperse in plastic carbohydrates, use of emulsifiers such as monodiglyceride sodium sulfo-acetate permits incorporating 10-15% oil as well dis-

Flow Chart of Perma-Stabil Process

↓

Hot plasticized mixture, mainly corn syrup solids

↓

Addition of dispersing agent (mono-diglyceride, sodium sulfo-acetate, etc.)

↓

Incorporation of orange or lemon oil, agitation to disperse oil

↓

Extrusion of hot plastic mix into liquid coolant, such as isopropanol

↓

Impact breaking of brittle filaments

↓

Removal of surface solvent by draining and vacuum treatment

↓

Small cylindrical rods of oxidation-protected essential oils

persed, uniformly small globules. Essential oil is best added slowly under the surface of the molten plastic carrier, which is held at 100-125C. in a steam-jacketed kettle with motor-driven impeller blades. The method is fully described in U. S. Patent 2,809,895.

Flavor granules are prepared by a two-step technique in which filaments are first extruded and solidified by dropping into a coolant. Then the brittle filaments are broken by impact.

Filaments solidify immediately by falling directly into a coolant such as high-proof isopropanol, which is non-solvent for corn-syrup solids. The hot plastic composition can be extruded into cold isopropanol at —10F. and the temperature dropped almost instantaneously from a high of 125C. without any thermal fracturing.

The pilot extruder consisted of a 4-in. tube with a perforated metal plate attached to the bottom by a screw fitting. The extruding leg was mounted vertically over the alcohol. Using 32-psi. gas head pressure with a plate having 150 holes each 1/64-in. dia., production exceeded 22 lb./-hr. Plant equipment now in use has a much higher production rate.

Particle-Size Control

Process factors that control diameter of the flavor rods include extrusion temperature, hole size, pressure on the semi-plastic flavor, and distance of free-fall between extrusion head and coolant.

One method of impact breaking of a slurry with isopropanol uses a 4-in. impeller blade operating at 1500 rpm. It breaks the material into continuously shorter lengths, the break line generally occurring at right angles to the axis of elongation, which minimizes exposure of new surface.

Such particle-size control not only enables selection of desired size range, but eliminates the disadvantage of attrition by slabbing and grinding — loss of about a third of the product, which is reduced to an unusable, fine, flour-like powder.

Isopropanol also removes any surface oil that results from impact breaking. Thus, any exposed surface oil that would be subject to off-flavor development on storage is eliminated.

After most of the isopropanol is drained from the granules, residual alcohol is removed in a vacuum shelf dryer. Finished product may be screened to remove any rods that are too large, and anti-caking agents can be added at this point.

Flavorings are standardized at about 10% by weight of oil. Moisture content ranges 1.8-2.8%. Product is available in orange and lemon flavors of both cold pressed and partially concentrated oil flavors. Other flavors that have been made include grapefruit, peppermint, wintergreen, tangerine, and lime.

Accent on Stability

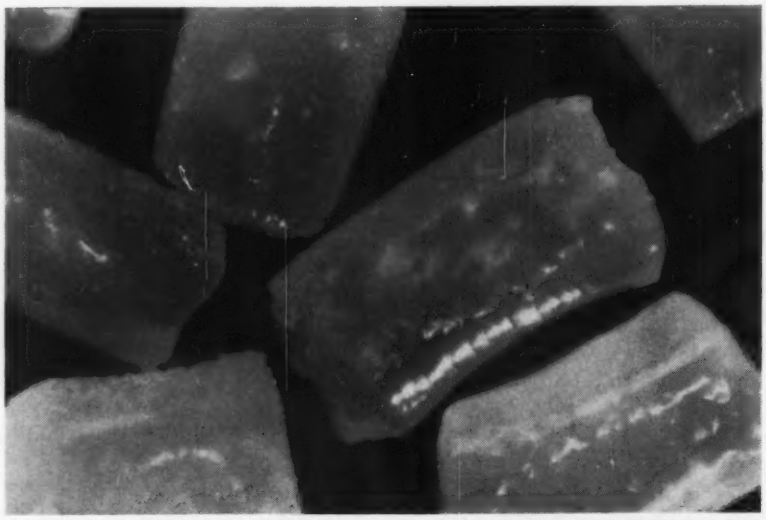
Flavorings are reported to be stable for several years when stored in dehydrated citrus beverage products. Even when containing cold pressed citrus oils, which have limited flavor stability, they were not found to be subject to development of so-called "terpy off-flavors."

In a test suggested by the Army Quartermaster Corps, both the orange and lemon flavors were subjected to 90 days' storage at 100F. Products were sealed in glass jars with calcium oxide desiccant. They passed this difficult test without fracturing or loss of volatile citrus oil—as shown by the following data:

Start of test
1.93% moisture, 10.2% oil
After 45 days
0.47% moisture, 10.4% oil
After 90 days
0.22% moisture, 10.5% oil

And even after 5 months of storage, there was still no sign of fracturing.

This feature was based on a paper delivered by H. E. Swisher of Sunkist Growers at the recent Chicago Conference of the Research and Development Associates.



FLAVOR RODS (here highly magnified) consist of citrus oils in a corn-syrup matrix that protects them from oxidation and flavor loss. Particle size ranges 20-80 mesh. The 'locked in' flavor is released only when product dissolves.

SILICONE NEWS from Dow Corning

Such Sweet Parting

Silicone Coatings Speed Unpacking, Reduce Waste, Step Up Production

Dates, candy, sweet rolls . . . will always be sticky, but that's no problem in packaging now that Syl-off® coated papers are readily available. Syl-off silicone paper coatings provide stickproof surfaces to a wide variety of food packaging materials and in-plant processing aids — kraft, parchment, glassine, boxboard, drums, bags, interleaving liners — permit quick, easy and complete removal from even the stickiest food products.

Food grade Syl-off coatings don't migrate, don't contaminate, don't transfer . . . and the use of paper coated with these silicone anti-adhesives to package foods is in compliance with provisions of the Food Additives Amendment of 1958.

For labels, too. As backing for labels, price stickers, banners, decals, and similar pressure-sensitive items, Syl-off coated paper peels free with ease — eliminates tearing, cuts waste, saves time.

Benefits you . . . whether you be packager or user. Syl-off coated papers come away cleanly and easily from the stickiest products — save time and money — help create repeat sales. Everyone gains.

What's your sticky problem? Will Syl-off solve it? Write today for more information and complete list of Approved Sources for Syl-off coated wrapping papers, bags, containers, drums, and processing aids with Syl-off coatings. Address Dept. 3717b.

For most efficient foam control in food processing, it's Dow Corning Silicones, too. Send for a copy of the new manual "ABC's of Defoaming".

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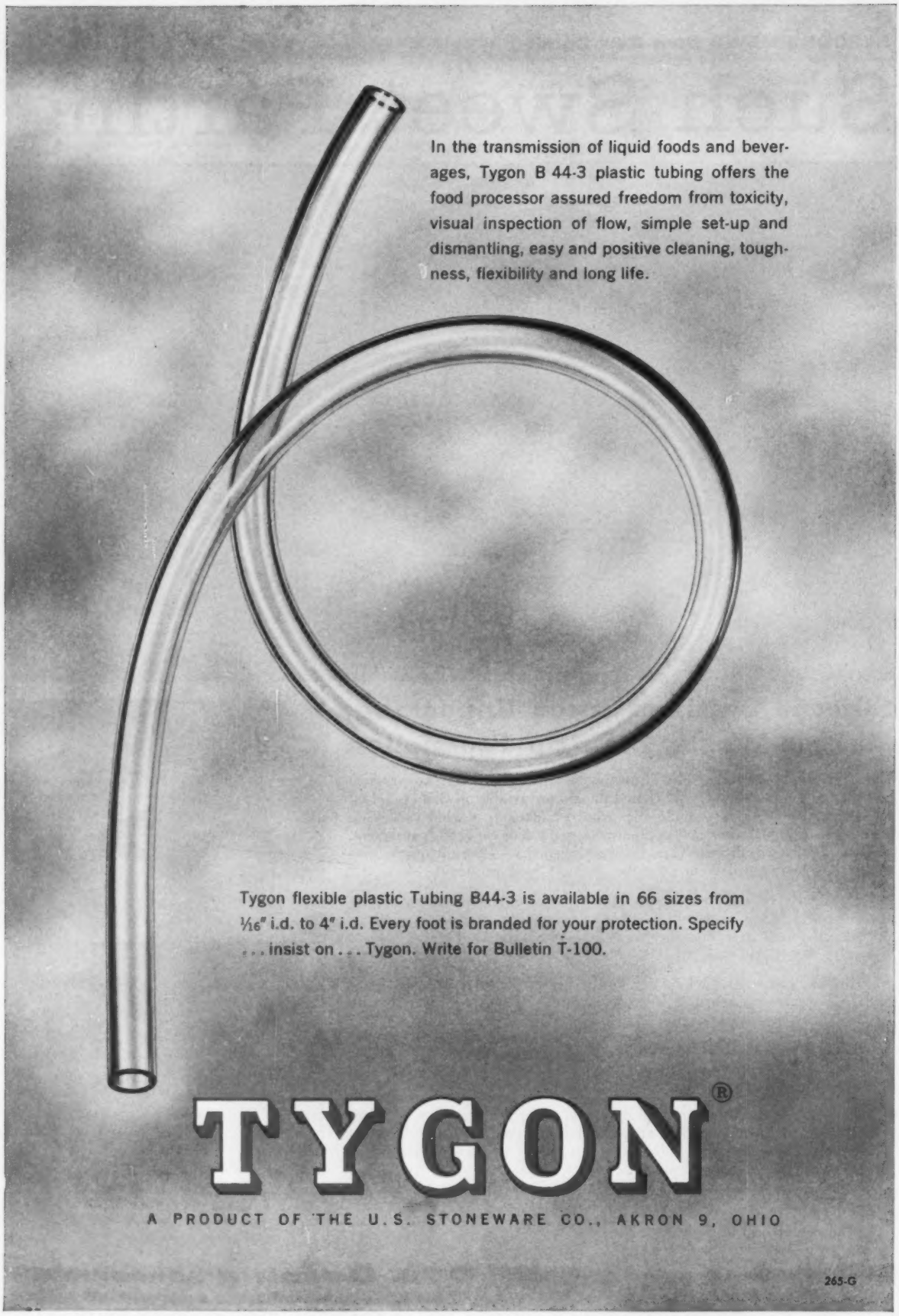
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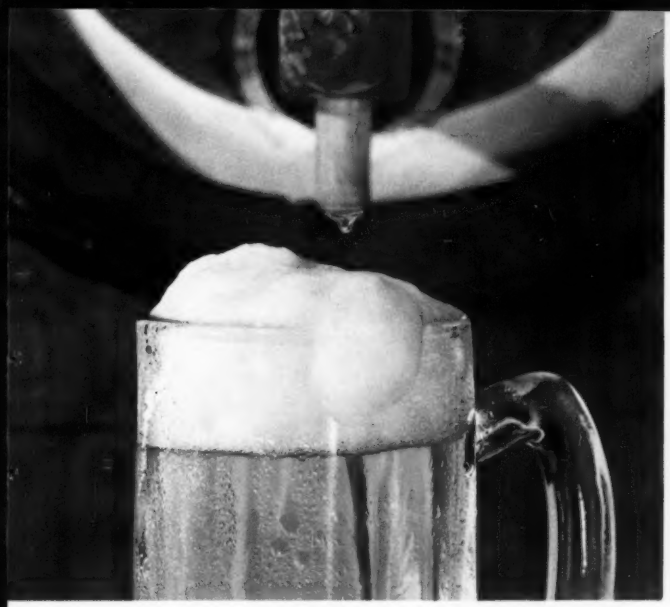

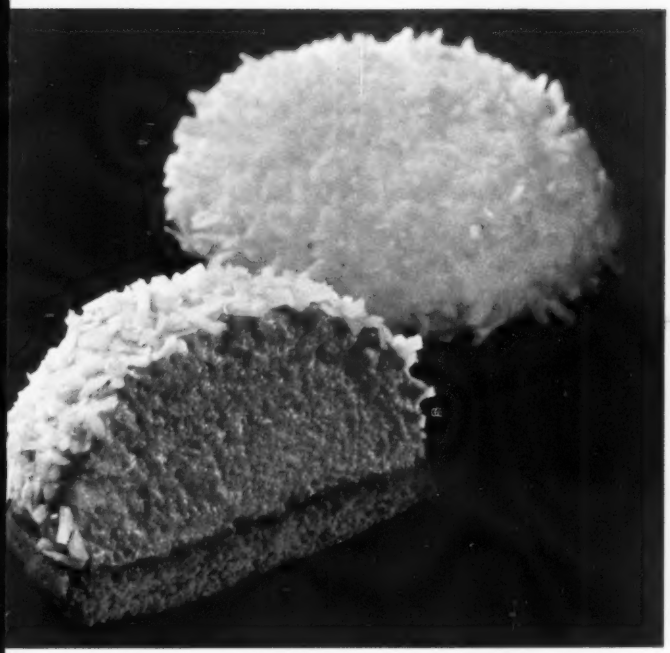

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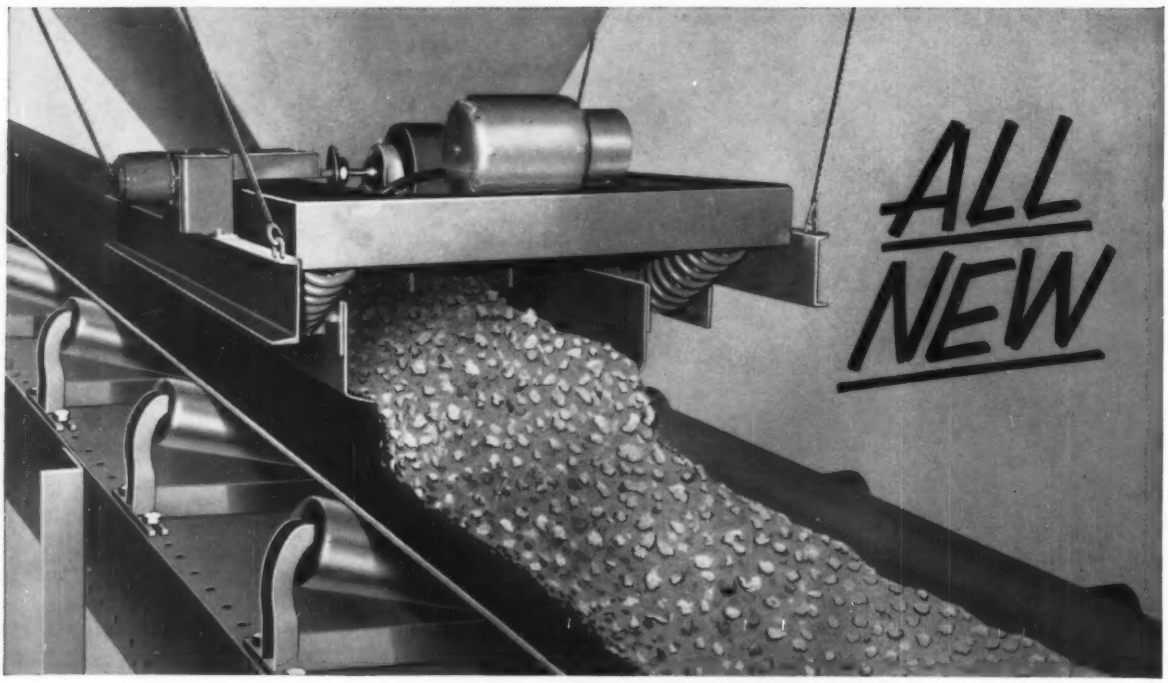

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REQUEST BULLETIN 261

S-A

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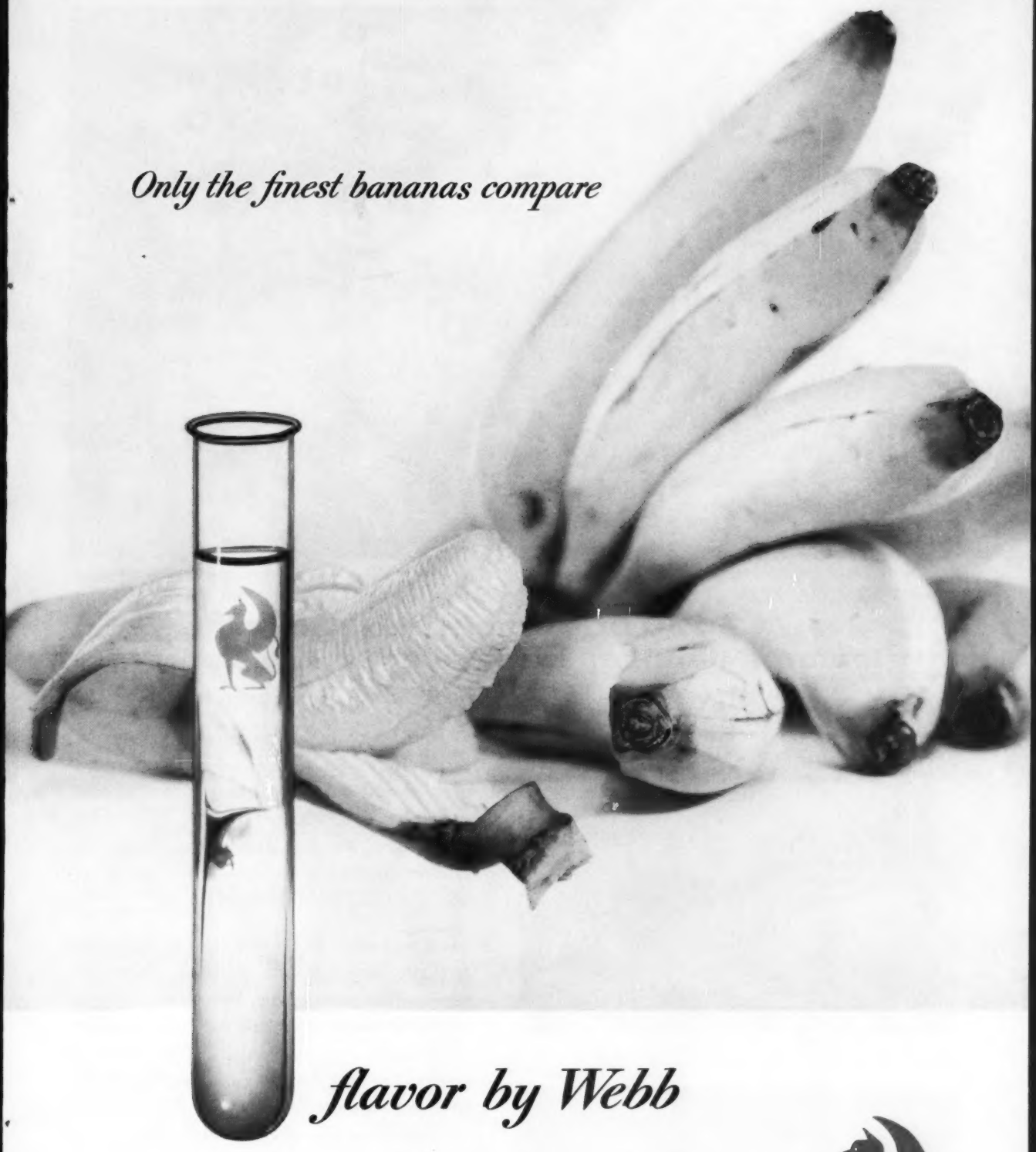

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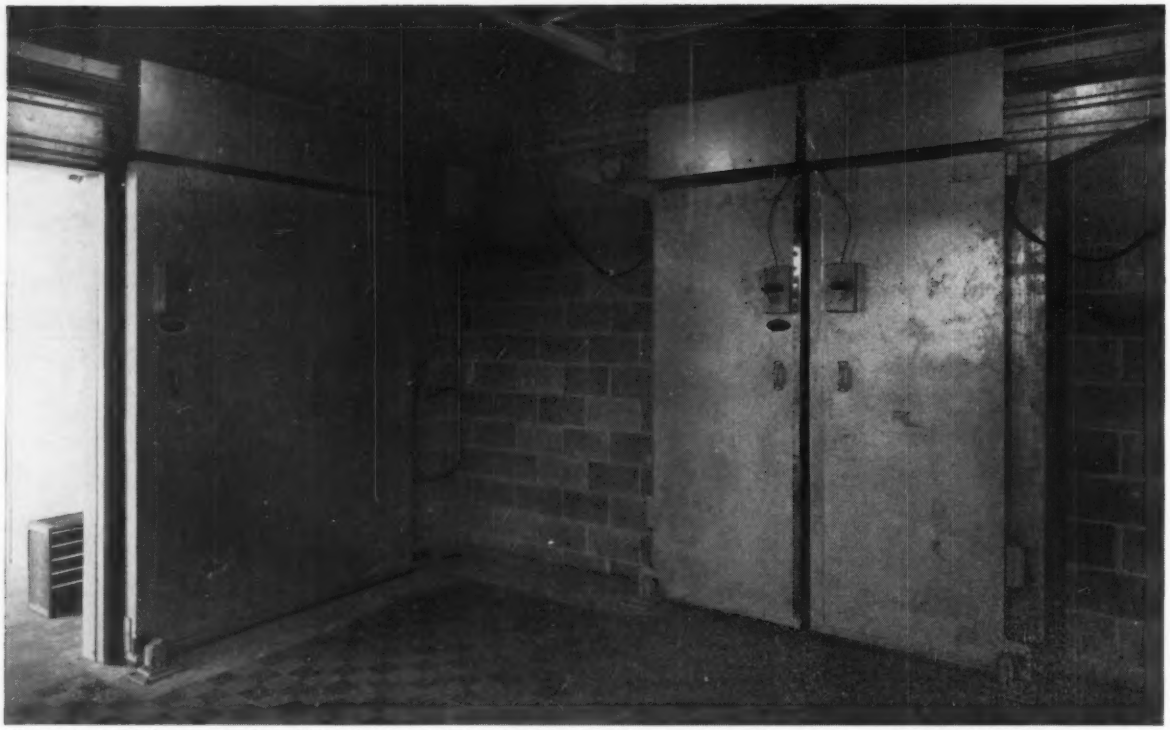
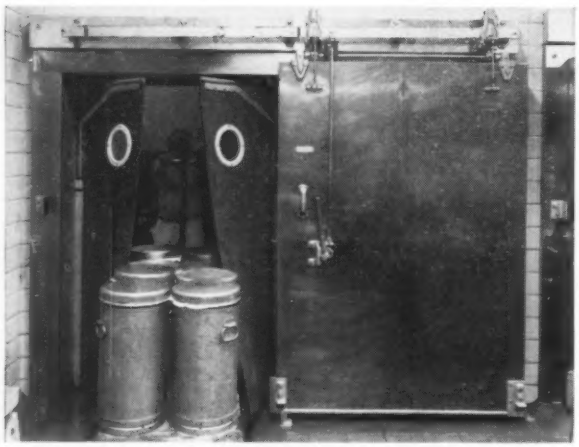
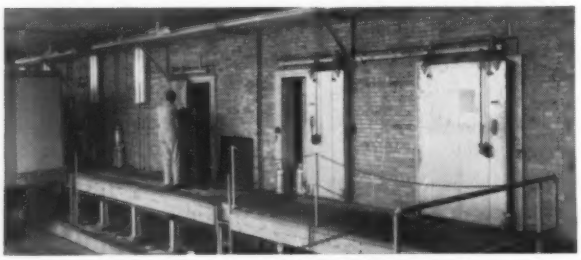


FAST OPENING AND CLOSING. Jamison Electroglide® Power Doors speed traffic to loading dock—single leaf cooler door, left, and bi-parting freezer door, right.

New $3,000,000 automated dairy plant features Jamison Horizontal Sliding Doors



SAVES REFRIGERATION. Jamison Manual Horizontal Sliding Door in combination with self-closing Flexidor®.



RAPID, CONVENIENT LOADING. Jamison Manual Horizontal Sliding doors facilitate loading of dairy products.

• In a dramatic advance toward automated processing of fluid milk and ice cream products, the Borden Company recently completed a new $3,000,000 plant at Milwaukee, Wisconsin. An important feature of this modern plant is a number of Jamison Horizontal Sliding Cold Storage Doors.

More and more, in the design of new, modern facilities like this one, Jamison Doors are specified to save space, minimize refrigeration loss, speed traffic and facilitate handling of products and materials. Get the story of the cost-saving benefits of Jamison Doors from your architect, or write to Jamison Cold Storage Door Co., Hagerstown, Md.

JAMISON

COLD STORAGE DOORS

Marketing Signals

More for wooing . . .

GF tries gourmet again

. . . Sees fewer brewers

Ad Spending Tops Sales Rise

Advertising outlays of food-beverage firms in four measured media (TV, newspapers, magazines, outdoor) rose 2.9% in '60. Data given to FE show that expenditures climbed from $768,282,187 to $791,317,991. Compared to this, manufacturers' sales rose only 2.5%, Census Bureau figures show.

TV continued to dominate, accounting for almost half of the food outlays. Ad volume on national TV was up 4%, from $132.7 million to $137.8 million, while spot TV rose 2%, from $241.7 million to $247.6 million.

Magazines rang up the biggest gain of all—8%. Food firms spent $168.0 million there vs. $155.5 million in '59. Outdoor ads edged up 5%, newspapers held even, and Sunday supplements skidded 11%.

Figures were provided by Television Bureau of Advertising, American Newspaper Publishers Assn., Publishers Information Bureau, and Outdoor Advertising, Inc.

GF Builds-In Chef Service

General Foods is testing a line of 25 prepared frozen entrees for the institutional trade. Included are such items as chicken in wine sauce, lobster Newburg, and stuffed Cornish hen.

Aim of the new program, says GF, is to provide mass feeding outlets with products of the type requiring culinary skill of a level that is becoming scarce. Firms report that acceptance has been good, especially among hospitals and in-plant cafeterias.

Recipes were developed by Robert Kreis, former chef at Hollywood's Brown Derby and originator of GF's Good Seasons salad dressings.

Sweets Are For The Sweetest

Women buy four times as much candy as men, J. Walter Thompson reports. Based on a survey of its consumer panel, agency says that females bought 75% of all chocolate volume; 82% of non-chocolate types; 78% of candy bars, and 81% of chewing gum.

Sidelight: 91% of all chocolates priced over $1 were bought for a special occasion vs. 48% for the cheaper variety.

Do-It-Yourself Slimmer

While most producers stress the convenience of their prepared liquid diets, Carnation figures there's a sizable market among people who want to stir their own slimmers. Company will promote a 44¢-a-day plan made up of its own instant nonfat dry milk (10¢), fresh whole milk (25¢), and standard multivitamin-mineral capsule (9¢).

American Dry Milk Institute figures that diet preparations will reach $100 million volume this year. There are some 240 different products in this field now, it says.

P-O-P Sparks Sales

One out of three supermarket shoppers who notices an in-store display ends up buying the product shown. So concludes Point-Of-Purchase Advertising Institute on the basis of a long-range research project which has just been completed. Among the customers polled, 82% said they had noticed a p-o-p display, 44% used the merchandiser as a basis for making a purchase decision, and 32% bought the product because of the display.

Displays had strongest effect in the cities. Only 29% of those polled in small towns bought a product after seeing the display, compared to 32% in suburban stores, 35% in city outlets.

Other phases of the project provide a helpful cost-per-thousand formula by which you can evaluate your p-o-p program. For details, write to the Institute, 11 West 42nd St., New York City 36.

Overcapacity to Plague Brewers

Impressive future growth in the 20-40 year olds won't cure brewer's woes. That's the gloomy forecast of *The Value Line Investment Survey*, well known financial analyst.

Basic brewing problem is overcapacity, the Survey states. Last year, consumption was just under 90 million barrels, while capacity climbed to 135 million barrels. **With this kind of imbalance, "smaller brewers will continue to disappear via mergers and bankruptcies," the Survey concludes.**

BRIEFS

Two-fifths of Campbell Soup's items have been introduced since '50, now represent 25% of company's overall business, Pres. Murphy reports.

Public schools will be buying $1 billion worth of food a year by '70 (compared to $600 million in '57-'58), USDA predicts. Rising school population, plus greater availability of school lunch programs, will fuel the increase.

FTC ruled that information developed in investigations which touches on formulas and processes will be kept secret. But ordinary business records, such as prices, customer lists, costs, can be made public.

Cures for a Sick Business

Potent remedies for ailing profits and prices score big hit with poultry and egg packers. Tips on how to expand market base have broad industry application

OTHERS WOULD profit by the "you better or else" treatment recently given troubled poultry packers. New departures in food marketing were presented as solutions to a business that is in bad shape. The setting: Annual Poultry Fact Finding Conference at Kansas City.

All to their good, poultry people got advice on:

. . . Setting up a marketing system to fit their business.

. . . Thinking through new product and sales ideas for boosting volume.

. . . Merging into combines big enough to match chains buying power.

Market Planning

Management consultant Robert C. Hills pointed out that underconsumption of poultry products among approximately six families in ten gives the appearance of over-production. Cure for this, he said, is to make adjustments "to the pattern of people's behavior, take advantage of them, and be sure you understand what's happening."

Hills reviewed these areas working **for** and **against** poultry products:

1) As a breakfast food, eggs have disappeared in many homes for lack of preparation time. Needed is a big drive to boost away-from-home consumption — such as omelettes and egg entrees for luncheons and dinners.

2) Eggs should hitchhike on the exploding field of easy-to-prepare-and-eat sandwiches and snack foods.

3) Whole turkey is essential for festive occasions, but not advantageous at other times. Birds should be processed in smaller units for broiling, baking, and casserole-use.

4) About 90% of the chicken consumed is fried or broiled because of convenience. **Challenge:** Make product easily available for **new** uses.

Shooting off a series of sales ideas, E. B. Weiss, Doyle Dane Bernbach ad agency, traced packers' woes to lack of market control.

"With a minimum of market control," he said, "there is a minimum profit. Control can be regained only by switching the emphasis from production to marketing.

"Production-oriented industries fight for market on price. Market-oriented industries can better control their markets because they have stronger price control. Your profits will get worse until marketing dominates your thinking."

Weiss suggested that processors:

. . . **Print recipe** ideas on egg cartons.

. . . **Study poultry** breeds to see if a special type will turn out a superior product—similar to milk produced by Guernsey cows.

. . . **Exploit diet** fads by relating eggs and poultry to present low-calorie trend.

. . . **Advertise,** aggressively, economical advantages of poultry and eggs.

. . . **Develop** new product uses for industry as well as the home.

. . . **Promote** newer breeds (such as Rock Cornish hen) to tie in with housewife's desire to achieve social status in home entertaining.

. . . **Dream up** combinations of eggs and a second food item to challenge today's ham-and-eggs leadership.

. . . **Examine** non-food outlets now selling foods in big volume. Fastest growing outlet for food today is the non-food type.

. . . **Offer** supermarkets a big related foods event (like soup 'n' cracker promotions).

. . . **Promote** a "breakfast special" by banding a dozen eggs with ½-lb. of bacon, offering the combination at a special price.

New Products Rate High

Of course, the new product route urged on packers has its pitfalls. To avoid these risks, warned H. L. Carstensen and N. H. McMillan, N. W. Ayer & Son, packers must steer clear of *"me tooism"* because "imitative items are the biggest cause of new product failures."

"Like it or not," they said, "the buyer can't tell the difference between your product and the next one. So price is usually what he sells for.

"However, the consumer is on the side of the innovator. He is loyal to the first brand on the market with a new product or to the brand that keeps improving."

Examples: Campbell can't take the ketchup business from Heinz. Yet Heinz has never dented Campbell's soup dominance. Hormel's Spam still leads the field, despite wide imitation.

Major risk-reduction device, the speakers pointed out, is consumer "trend watching"—giving a customer more of what she wants, less of what she doesn't want.

One hopeful trend they see is the growth of "miniature mass markets." Instead of "going for broke" in big mass markets, they said, packers should concentrate on these smaller specific markets —like baby foods and senior citizens.

L. H. Geil, Poultry & Egg National Board, questioned whether eggs must be marketed exclusively as a staple. He suggested the

JOHN V. ZIEMBA
Senior Associate Editor, "Food Engineering"

possibility of canned or bagged versions for frying, scrambling, and poaching. He also posed these teasers:

► **Frozen French toast**—an egg for two bread slices. Product has been successfully test marketed, yet no poultry packer has tried to market it regionally or nationally. Potential here is a billion eggs a year.

► **Pep Cocktail** — an egg-orange juice blend—could be merchandised as a 152-calorie liquid breakfast (8-oz. drink). Its over-the-fountain-counter potential: About 720 million eggs annually.

► **Putting the drink into a concentrated powder,** packaged like tea bags (24 to box), would result in a convenient, quick-serving product. Annual egg potential: Over 3 billion.

Arguing that the balance of power must be restored between buyers and sellers, W. A. Haffert, Garden State Publishing, urged independent operators to "merge before you have to." He contended that massive selling power must be formed to counter big buying power.

He predicted that "feed manufacturers will be selling their product as branded food on a national scale probably within 3 yr., certainly within 5. They'll take most of the business, unless packers coordinate their production and sales power."

"Take the initiative while you can," he advised. "Carefully choose your partners. Combine your assets while they're strong. Select a single marketing agent, and make yourself wholly subordinate to this function. But stick to only one boss—the marketer. Otherwise, you're destined to failure before you start."

Looking to the future, he predicted:

. . . More government in agriculture. It could be beneficial rather than disastrous.

. . . Revitalized cooperatives acting more like corporations.

. . . Large food processors not moving into poultry production or retailing.

. . . National feed manufacturers and integrators competing for the market.

. . . "Little fellows" have a bright future, provided they'll do an intensive personal selling job in markets large operators generally consider unprofitable.

. . . More total integration before there'll be less. (End)

Low-Cost Source of New Products

RESEARCH by government and colleges offers smaller-sized firms an easy way to latch on to profit-building new products. Often, the company most in need of new products can't budget the expensive R&D work that is required.

But government and college labs —concerned with finding new end-uses for farm commodities—every so often turn up a potential gold mine that a food maker can tap for free. Most outstanding example is USDA's instant potato flakes—whose retail sales have zoomed from nothing to more than $30 million the past few years.

Recently, Cornell Univ.'s Agricultural Experiment Station developed three new poultry and egg items that passed market tests with flying colors. These, like all items developed in the country's agricultural experiment stations, are available to processors.

FRENCH TOAST, made with high protein bread and ½ egg per slice, scored well in bacteria count and oxidative rancidity tests.

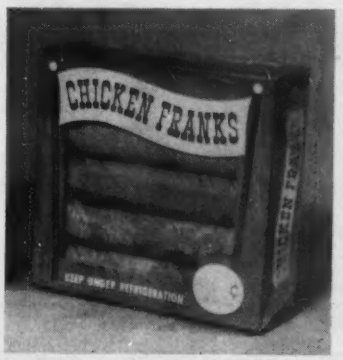
The Cornell-developed products:

▸ **Frozen French toast, designed to increase egg sales.** As figured by the university, manufacturing cost for a carton of 12's (4 slices in each box) would come to $1.73. Outlay is broken down thusly: 90¢ for bread and batter; 24¢ for labor; 26¢ for packaging; and 33¢ for selling expenses.

Carrying a 31% markup, product was market-tested in 3 Ithaca supermarkets for 9 weeks. Sales averaged 466 boxes a week, could have been higher but for stores that ran out of supplies.

According to researchers, the product "offers housewife an opportunity to save substantial time in preparing major egg dish for breakfast, and get children to eat eggs without difficulty."

Projecting the results nationally, researchers figured that, based on 20,000 supers averaging 30 boxes a week, total volume could reach 600,000 boxes. And with each box containing 2 eggs, this means a plus market of 100,000 dozen eggs a week.



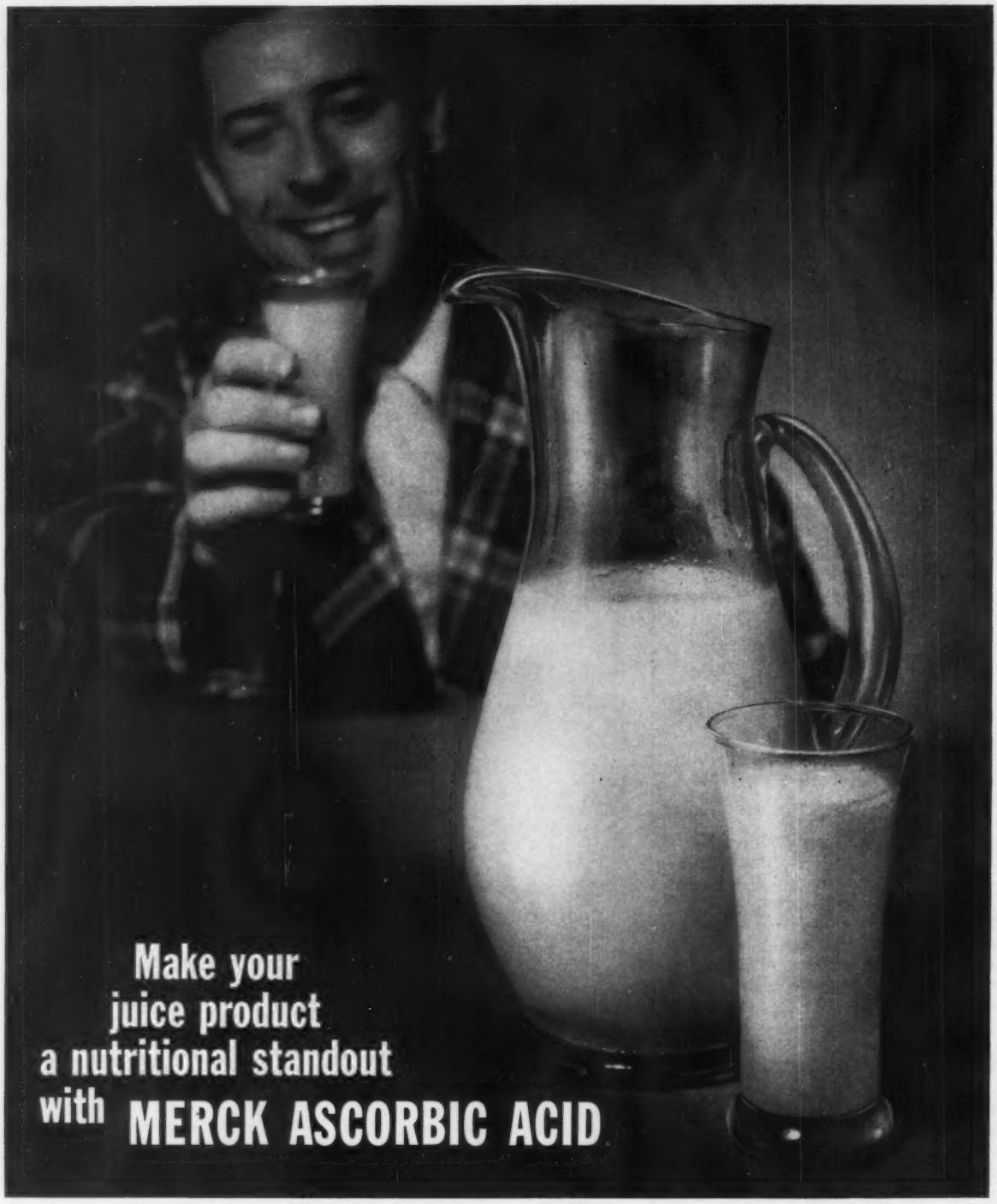
CHICKEN FRANKS had minimum refrigerated shelf life of 16 days, appealed to those who can't eat red meat-type spiced version.

▸ **Chicken frankfurters, aimed at expanding end-use of Leghorns.** Two different types of manufacturing plants were used to get a range of the costs involved. Spread was 57¢ to 63¢, broken down as follows: Ingredients, 36¢; manufacturing, 14-18¢; sales, 3-5¢; shipping and delivery, 4-5¢.

Tested in 3 supermarkets with a retail price of 65¢/lb. (to make it competitive with regular meat-type version), the product chalked up sales equal to about 10% of red-meat frankfurter volume. With per capita consumption of franks at 6.2 lb./year, the chicken product, according to researchers, could become a 108 million-lb. market. And with one Leghorn equal to 3 lb. of finished product, some 36 million birds—or 10% of the number on farms at the start of '60—would be required.

▸ **Barbecue sauce, to stimulate poultry sales, especially during warm weather months.** Cost of making 6-oz. jars came to 12.7¢ —based on 4.2¢ for packaging; 3.3¢ for ingredients; 0.8¢ for labor; 1.3¢ for depreciation and overhead; 3.1¢ for selling expenses.

Consumer sampling during the market test indicated that among customers who barbecue fryers, 67% used a home mix, 28% bought a ready-made product, 5% used no sauce.



There's nothing like a strong nutritional story to give your new or improved juice products that all-important competitive edge. And there's nothing like standardization of Vitamin C content with Merck Ascorbic Acid to provide the basis for promotable nutritional claims.

Merck is in an excellent position to help you profit from Vitamin C fortification. We are one of the world's largest producers of Ascorbic Acid and deal with food processing problems daily. Our facilities and experience are at your command. Just call in your Merck Representative or write directly to Rahway.

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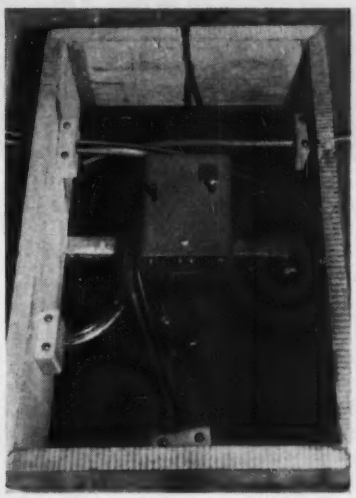
Automates Maple Syrup Process

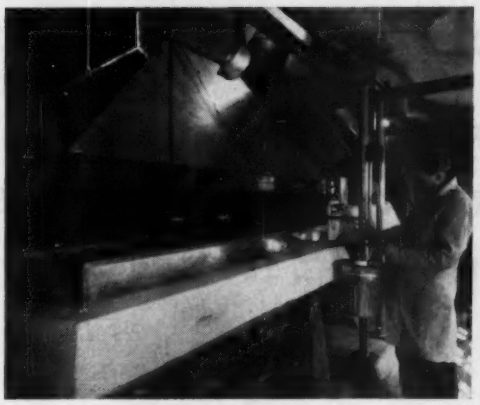
Vinyl plastic tubing, electronic level control unit, and two-stage evaporator form heart of $1,500 maple sugar "factory"

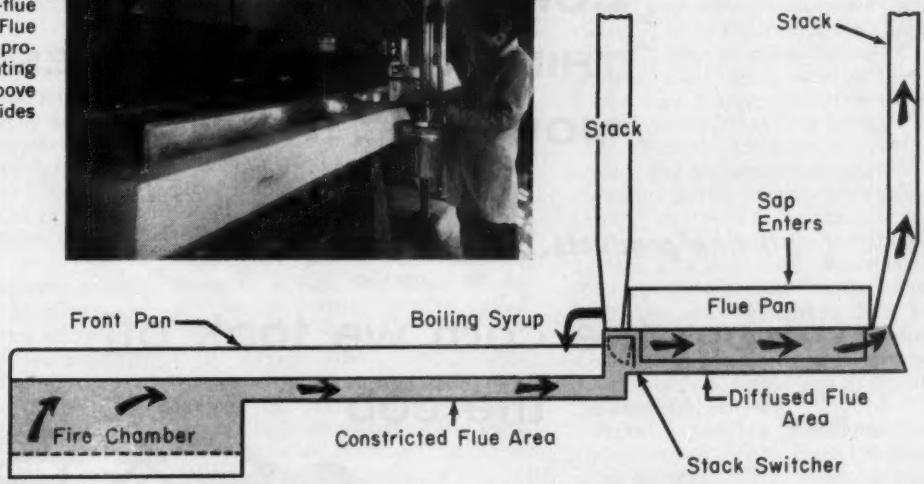
1 COLLECTING TANK (385 gal.), located at basin bottom of maple glen, is fed by 7,000 ft. of clear vinyl plastic tubing (Minnesota Mining & Mfg. Co.) laced to 300 trees. Polystyrene plastic spiles (MMM) are used to tap trees in a 1,000-ft. radius. When sap in tank reaches certain height . . .



2 ELECTRO - MECHANICAL FLOAT trips a snap-action switch (Micro Switch) to energize a Versa-tran relay system (Minneapolis-Honeywell), an extremely sensitive electronic level control which turns on a pump motor. When sap level drops, float trips a second precision switch, turning off motor. Sap is pumped into . . .

3 EVAPORATOR, a two-stage unit located in cookhouse. Evaporator consists of two pans, a baffled front pan 7-ft. long, and a conventional 5-ft. drop-flue or hollow-finned pan. Flue pan, containing 18 flues, provides a 120-sq.-ft. heating surface. A 35-ft. stack above evaporator surface provides adequate draft.





4 COLLECTED SAP flows into flue pan for pre-cooking and then into front pan for further processing into syrup. Cascading flow is electrically controlled by level controls in front pan which automatically actuate solenoid valve on connecting pipe. Evaporator, designed by farm-owner and Minneapolis-Honeywell engineer LeRoy Alwin, features a constricted flue area (3-in.) which squeezes flame from furnace and boosts flue gas velocity. Technique draws flames over a larger pan surface without a corresponding increase in fire. Increase in height from front to rear pan aids draft and eliminates smoke and fumes when starting. As sap reaches low limit in flue pan, alarm rings and operator flips stack switcher to drop damper, diverting heat and smoke up stack. Rate of firing is then decreased and remaining syrup is finished in forward pan. Unit evaporates about 100 gal. of sap per hour at syrup-to-sap ratio of 1:33.

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St. Louis, Missouri

Charles G. King

World Malnutrition Challenges America

Half of population lives in areas deficient in food energy and nutrients. To help is to win friends for freedom

HALF THE WORLD'S population lives in areas deficient in food energy and nutrients.

By far the most damaging form of malnutrition is the protein deficiency that occurs in the age range of six months to four years. The typical pattern is found in many rural and village sections of Central and South America, the Caribbean Islands, Africa, the Near East, India and Southeast Asia.

The very small child, when weaned, is transferred to a low-cost diet relatively high in starch but grossly deficient in good quality protein. Adequate supplies of milk, meat, fish, poultry or eggs are not available within the economic reach of low-income families.

In Central America, for example, the diet after weaning is chiefly cold cornmeal, pancakes and boiled beans — supplemented by varying amounts of bananas or other fruit.

The quantity of protein furnished by corn and beans would be enough if it were equal in nutritive value to the proteins in milk or meat, but it is not.

The result is that growth stops within a few months. Swelling of the feet, hands, face and abdomen develops gradually. Then brown and red blotches and ulcerations begin to show on the skin. Resistance to infections drops to a low level. Severe diarrhea nearly always follows. After a time there is generally a distinct change in the hair and scalp. The coarse, black, straight hair is replaced by hair that is thin and turns to a brick red or reddish gray, and easily falls out.

Death rates rise rapidly.

Protein Can Save Them

If the sick are given a good quality protein food such as milk, meat, eggs or fish before they are too far gone, the recovery rate is generally good. The swelling disappears fairly rapidly. Growth and strength slowly return, and the child appears to be normal.

Growth stunting, however, is never corrected. The children affected stop growing in their late teens, still short in stature by two-to-three years of growth. How much other injuries carry over into later years is not known.

In many other parts of the tropical and subtropical world, the pattern changes only in detail. In Northeast Brazil, for example, the chief caloric source may be the tapioca root—extremely deficient in protein. There, too, addition of beans may permit survival. But there is a high incidence of the protein deficiency disease called "kwashiorkor."

In Africa, the chief caloric source may be millet, corn, rice, tapioca or crude sugar—supplemented by various beans and peas. But the disease has the same devastating effect.

In northern India, diets are fairly good where there is a mixed type of agriculture with more milk and wheat. In the southern Central and eastern sections, however, there is much stunting of growth on diets that are too greatly restricted to rice, millet, or tapioca.

Where population density is high and food practices have not advanced, sickness, death and short life spans tend to hold society to a mere survival basis. Normal economic or cultural progress and political stability are impossible.

Thrilling Improvements

It is thrilling to see the specter of famine, sickness and social paralysis retreat as good food, safe water, new schools, and modern farms become more available.

In Mexico, for example, modern agriculture has boosted the whole economic, health and educational strength of the country. The first major step was to increase corn yield. Then followed rapidly higher yields of other crops—including meat, milk and poultry. There was a net gain of revolutionary proportions in a few years.

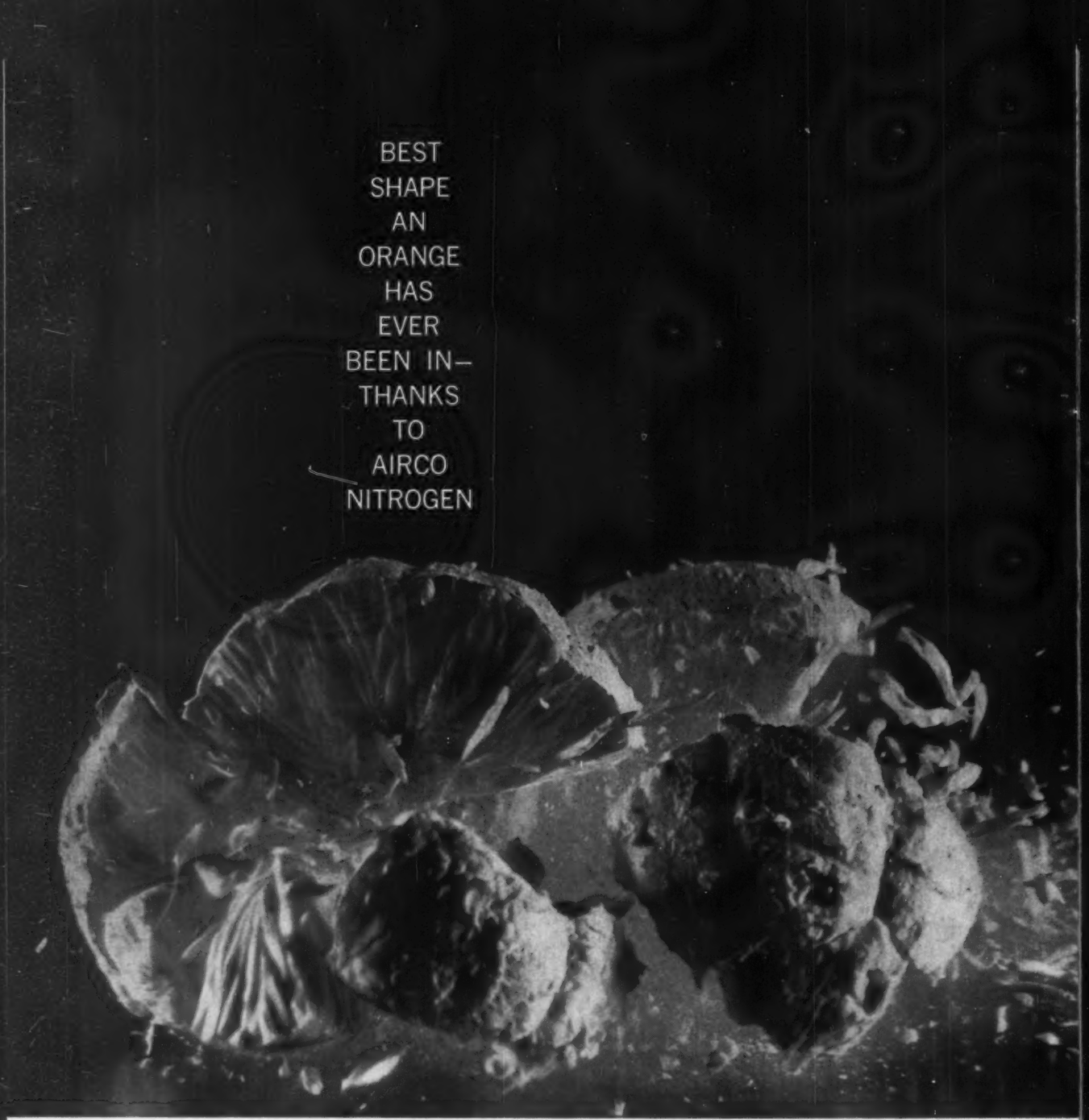
In Central America a special project has accomplished outstanding gains in the food sciences, education, and public health. A recent specific feature is the introduction of a new kind of low-cost food combination to protect the health of small children. This is based on a scientific blend of corn meal, sorghum meal and cottonseed flour. It meets requirement for essential protein.

Equally exciting programs are under way in India. Here the aim is to increase milk, meat, grain, vegetable and fruit production. Such an achievement will accelerate economic and social progress in that critical area of the world.

There can be no doubt of the nutritional challenges that confront us. (End)

CHARLES GLEN KING
Executive Director, Nutrition Foundation, Inc., New York.*

* *Statements at recent National Youth Power Congress in Chicago.*



Quick frozen in Airco liquid nitrogen at –320°F., a ripe orange shatters on impact into its myriad juice cells . . . and is ready to flavor new food products.

Ice cream full-flavored with literally hundreds of true orange juice cells . . . juice cells intact with all their original tantalizing tang. Imagine the market appeal!

A dish like this is now possible for the first time, through Airco's new process of immersion freezing. How does this revolutionary process work?

Drop a peeled orange into a tank of liquid nitrogen (temperature 320° below zero F.). Instantaneously frozen, the orange can be shattered into thousands of individual juice cells, each intact, each retaining all its native flavor and nutrient value. Here is an orange at its best, ready to spark more profitable products for processors.

Peaches, cherries, tomatoes, corn and a long list of other fruits and vegetables already are being test frozen this way in tanks of Airco liquid nitrogen. The results – usually impossible to achieve heretofore – promise many exciting new food treats for tomorrow.

In nearly every industry today, modern Airco processes based on gases are improving quality, boosting production, reducing costs. Airco gases can give you cold . . . heat . . . special atmospheres . . . or can act as raw materials for chemical reactions.

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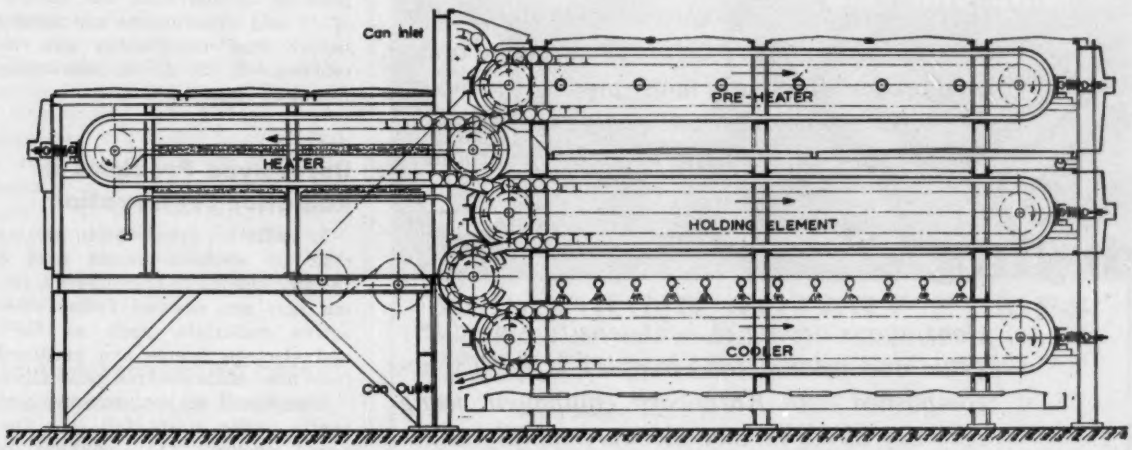
Advances in Technology



LONGITUDINAL view of flame-sterilizer shows the four phases in new method of processing canned foods. Cans pass consecutively through: Pre-heater, heater, holding element, and cooler.

New Continuous Sterilizer Permits Short-Time Processing of Canned Foods

Rotation at 120 rpm and carrying can through gas flames are features of a new continuous sterilizer. This method enables high-temperature, short-time processing of mobile products such as peas in brine.

The cans, pushed by transverse bars along a flattened spiral runway, are first pre-heated in steam, then brought up to processing temperature of about 125C. (275F.). Cans are held at this temperature for complete sterilization and finally cooled rapidly by water sprays.

The temperature of the cans is measured with a wire thermocouple over which they pass, and checked with organic compounds of definite melting point sprinkled on the cans.

Advantages of the system are: Short coming-up time, quick process, no inlet or outlet valves, and easy accessibility of all parts. One problem is the resistance of cans to internal pressure without counterbalancing by external pressure. Small diameter cans (55 mm, 203) present no difficulty. For larger cans it is sufficient to choose the proper temper and thickness of plate and profile of ends, and to close cans at temperature of at least 80C. (176F.). Still-larger cans may require ends similar to those of the beer can.—*Food Technology*, 5-9, April 1961.

Irradiation Treatment of Beef Evaluated

Beef steaks subjected to pasteurization doses of irradiation have been reported to have their shelf-life at chilling temperatures improved as much as five times. Wholesale cuts of beef (beef shins) were stored at 32F. for 24 hr., then irradiated with gamma rays from Co-60. Subsequent storage was at 32, 30, and 23F.

At 100,000 rads the only detectable change was a slight tallowy odor in the raw fat. At 200,000 rads both color and odor changes occur, the lean meat is darker, the beef odor was more marked, and there was a very slight off-odor.

When the beef was cooked by steaming, an experienced taste panel of nine scored the control beef and the 100,000 rad samples 6.2 and 6.4 respectively, while the 200,000 rad sample scored only 5.2, a drop not quite significant at the 5% level.

When the beef was irradiated in polyethylene bags, with doses up to 100,000 rads, the storage life increased from seven days in the control to 28-29 days for irradiated samples. However, sufficient bleaching of superficial fat and development of tallowy odors occurred to make the irradiation treatment of doubtful value.—*Jour. of the Science of Food and Agriculture*, 690-694, 11(12), 1961.

Device Quickly Separates Immature Raisins

A device has been developed that removes immature raisins and trash from a sample of natural-condition raisins in 10 min., compared with an hour of hand work by the usual method.

The equipment employs an airstream to blow out the lighter, immature raisins and trash. In repeated tests, it made satisfactory separations with more accuracy than achieved by the usual hand-sorting method.

Preliminary studies indicated there is a wide range in the proportions of sub-standard raisins in loads delivered by growers. The new device may make it feasible to determine the percentage of immature raisins in each load, instead of the present practice of determining only that there are more or less than 10% of im-

toasting

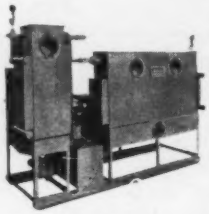
Continuous, automatic drying with air at precisely controlled temperatures up to 1000°F (for example, continuous toasting of cereal and other food products) is one of many processes in which Kathabar engineers are unusually experienced in the handling of both the air and the product.

drying

Continuous drying of heat-sensitive products (glue and gelatin, for example) is readily accomplished with Kathabar® equipment, using very dry air to remove moisture rapidly under precise control. Kathabar systems reduce cooling requirements, end condensation problems, operate continuously with low maintenance.

cooling

Continuous delivery of sub-freezing air down to extremely low temperatures, without frost or recycling, is one of Kathabar's unique capabilities, whether the air is for storage, testing, or processing. Data on Kathabar equipment for toasting, drying, or cooling is available promptly.



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street .....

city .....*zone* .....*state* .....

mature raisins in each load.

Attempts were made to use the airstream equipment to sort minimum grade B raisins from Standard grade. The sorter showed some promise in this field, but further study and experiments are needed before final conclusions can be reached.—*U. S. D. A. Marketing Research Report No. 451.*

Unresolved Problems in Radiation Preservation

In radiation preservation gamma rays or electron beams destroy the spoilage micro-organisms. Gamma rays are derived from radioactive materials, such as Co^{60}, and electron beems are produced from man-made electron generators.

Unresolved major problems currently under study fall into two broad groups: (1) changes in food characteristics, and (2) safety of irradiated foods.

Radiation can induce an off-flavor, change color, texture consistency, and other properties, such as baking strength of flour. Until these changes can be controlled more effectively, radiation preservation can have only limited use.

Another problem involves safety. Chemical changes induced in food could produce toxic substances and thereby render the food unsafe. However, two or three more years of work are needed on this matter before final conclusion can be reached.

No irradiation process can be used until approved at least by the FDA. Further, the public will have to be educated to understand and accept the safety of irradiated foods. Thus, until these problems are resolved, this method appears to be several years away from commercial use.—*Journal of the American Medical Assoc.*, 1310-11, Nov. 5, 1960.

Baking Time Reduces Bacteria in Meat Pies

Baking time has a marked effect on the survival rate of organisms innoculated into chicken meat pies prior to baking and freezing them. Four organisms, all having sanitary or public health significance were used in a series of tests on laboratory-made chicken pies baked at 425F. for 20, 30, and 40 min.

After 40 min. at 425F. nonsporeforming bacteria survived to the extent of 0.0002% to 0.1%,

while the spore-forming *Bacillus subtilis* survived at the rate of 0.35%. A 30-min. baking showed 0 to 3.6% survival with *Streptococcus faecalis* showing the highest survival rate. After 20 min. of baking at 425F., 14 to 100% of the non-sporeformers survived while the sporeformers with 150% survival seem to have multiplied.

The 20-min. bake yielded underdone pies in which the crust had a raw appearance. Baking sufficiently will greatly reduce the number of bacteria in these pies, but this should not be relied on to mask poor sanitation in their preparation.—*Applied Microbiology*, 6-10, 9(1), 1961.

Oxygen-Scavenging Packet Deoxygenates in Package

The glucose oxidase - catalase system can completely remove oxygen from a closed vessel. Based on this system, an oxygen scavenger in a packet has been developed for in-package oxygen removal for use with dehydrated foods.

Shape of packet, shape of container, packet location, and particle size (for solid particles) are shown not to affect rate or completeness of oxygen removal.

Spray-dried products require more time to deoxygenate than foam or drum-dried products since entrapped oxygen must diffuse through the hollow sphere wall.

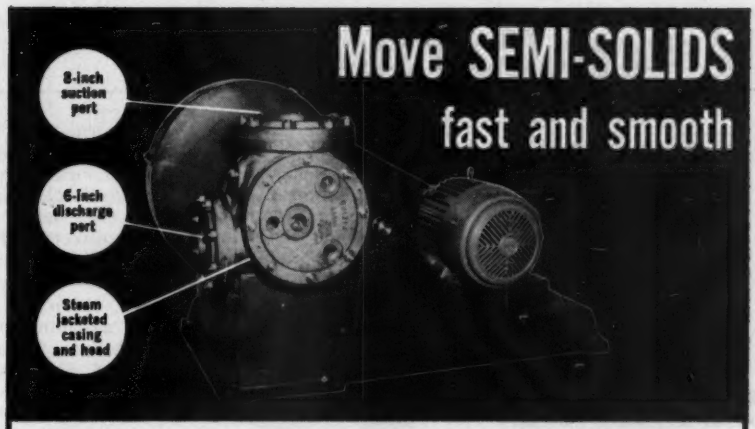
Also studied were the stoichiometric relationships, and implications of OxyBan (scavenger trade name) as a substitute for vacuum and gas packing.—*Food Technology*, 99-104, Feb., 1960.

Reflectometer Measures Flour Whiteness

Wheat flour whiteness was determined by means of photoelectric tristimulus measurements and substitution of reflectance values A, B, and G in a newly derived equation for whiteness.

This formula in its simplest form: $W = G - A + B$ simplifies the calculation whiteness considerably, and therefore should be considered useful for routine application.

Obtained results were in complete accord with the visually estimated orders as found by means of the Pekar test. They can be considered as representative for visual judgments in average daylight. —*Cereal Chemistry*, 8-13, Jan., 1961.



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Moving thick, viscous materials is routine work for this Viking Pump because it's made to do that job. Vikings are built to cut costs and do jobs better. For example, like the unit shown above . . .

- The pump is all bronze.
- It has an 8" suction and a 6" discharge.
- It has a steam jacketed casing and head.
- It delivers a corrosive thick material of 350,000 S.S.U. viscosity, at 50 G.P.M. against 150 P.S.I.

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Cedar Falls, Iowa, U.S.A. In Canada, it's "Roto-King" Pumps

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CIRCLE 171 ON INQUIRY CARD

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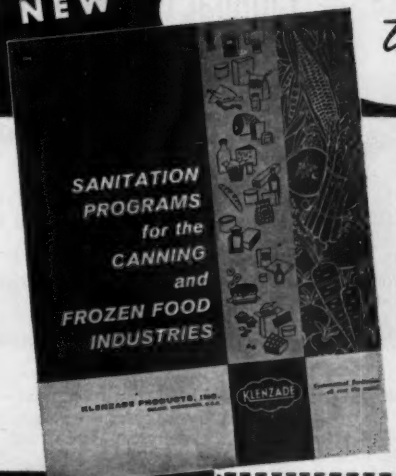

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Points the way to TOTAL cleanliness in all departments . . . by employing today's advanced technological developments, methods, and products in food plant sanitation and quality control.

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CIRCLE 115 ON INQUIRY CARD

Men & Companies

James L. Rankin

Rankin Heads Foremost . . . James L. Rankin, executive v.-p. and director, has been elected president and chief executive officer of Foremost Dairies, Inc. Paul E. Reinhold continues as board chairman and Dr. Grover D. Turnbow, president of Foremost since '53, becomes executive committee chairman. Rudolph J. Drews takes over as administrative v.-p.

Mr. Rankin came to Foremost last year following his affiliation with Pillsbury Co's. Grocery Products Div. where he was responsible for industrial, public, trade, and personnel relations.

Foremost is one of the major dairy products companies in the world. Serving more than 2300 communities in the U. S. and distributing its products in over 40 countries overseas, its sales in '60 exceeded $437 million.

Douglass L. Mann

Sarah Lee V.-P. . . . Douglass L. Mann moves up to executive v.-p. at the Kitchens of Sarah Lee, Inc. The position has been vacant since the death of Jack Kollman in '59.

Before joining Sarah Lee last month, Mr. Mann was manager of the Grocery and Manufactured Products Div. of Foremost Dairies in Calif. He has previously held the post of v.-p. and sales director of Western Condensing Co., a division of Foremost.

Mr. Mann has served as staff assistant to the v.-p. in charge of Fleischmann Div. of Standard Brands, Inc., and as general sales manager of Congoleum-Nairn, Inc.

John H. Ehrenfeld

Heads Libby's Meat Div. . . . John H. Ehrenfeld takes over as v.-p. in charge of Libby, McNeill & Libby's Canned Meats Div., succeeding Clinton L. Nelson who is retiring from his post after 30 years service.

Mr. Ehrenfeld began with Libby as a salesman in Pittsburgh in '40 and later moved up to merchandising director for the Canned Meats Div. He is current president of the National Meat Canners Assn.

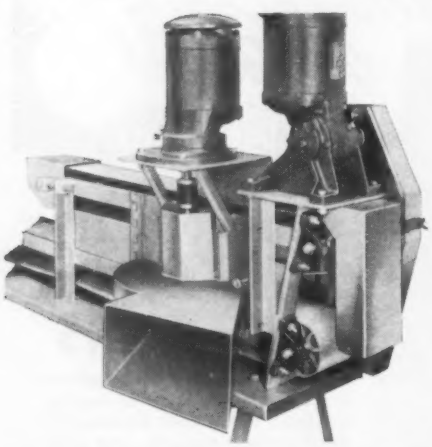
Retiring v.-p. Nelson has been in charge of Libby's Canned Meats Div. since '53. He began his career with the firm in '30 as a salesman, was transferred to the Chicago general office in '31, and appointed manager of canned meat sales in '42.

Libby has recently completed construction of a multi-million dollar canned meats plant in Chicago.

Personnel

Paul B. Thompson, former executive v.-p. and treasurer of Cudahy Packing

LANGSENKAMP . . . providing new and better ways to solve your food processing problems



• Improvements developed in three years of actual use include . . . Improved blade and belt adjustments. Three-section design that may be extended to any length desired. Simplified guards: easy to remove, replace and clean. Non-clogging waste discharge. Self-aligning ball bearings.

Compact, mechanical tomato trimmer cuts trimming costs...trims swiftly and surely ...increases overall capacity of lines!

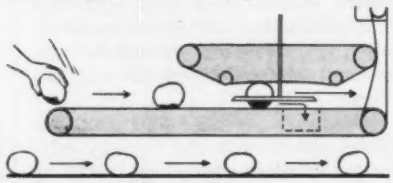
• **Tomatoes handled only once.** Trim as you go . . . no need to set aside, trim and return tomatoes to belt. (Culls excepted).

• **Insures a regulated trim** that greatly reduces waste.

• **Fast, automatic trim** boosts production tons per hour, yet maintains high product quality.

• **Satisfied users save enough on hand trimming costs alone to pay for the machine in a single season.**

• **Installs quickly, easily** on existing conveyors. Easy to keep clean . . . easy to maintain. Only stainless steel touches tomatoes.



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Co., takes over as president and chief executive officer.

John Shafer moves up to marketing coordination v.-p. at Dole Corp.; **Edward J. Feigan** is now new product development manager.

Dr. Kurt Ladenburg moves over from International Salt Co. to Falstaff Brewing Co. as R&D director.

James McManus assumes manufacturing v.-p. post at Continental Coffee Co., Chicago.

Dr. Albert L. Elder has been appointed first director of a newly established Institute of Nutrition at Corn Products Co.

Donald M. Kendall, president of Pepsi-Cola International, Ltd., has been elected a board member of parent company.

Carl M. Jernigan has been named v.-p. of Fanta Beverage Co., a division of Coca-Cola, Ltd., (Canada) which markets a soft drink line under trademarks "Fanta" and "Sprite."

Jack L. Kelly moves up to sales v.-p. at The Frito Co.

Desmond H. O'Connell takes over as executive v.-p. of American Bakeries.

Gilbert J. Buettner is now marketing v.-p. at Seeman Bros., Inc.

James S. Lawless, president of Frosted Food Products, Los Angeles, is now president of National Assn. of Frozen Food Packers.

Dr. Majel M. MacMasters has been named president of the American Assn. of Cereal Chemists. This is the first time in 20 years that a woman has been elected to that post and only the third time in AACC's 46 year history.

Dr. H. C. Diehl, pioneer frozen food research scientist, will be recipient of Nicholas Appert Award at the annual meeting of the Institute of Food Technologists this month in NYC.

Roy T. Smalley has been elected president of RC Bottlers, Inc., subsidiary of Royal Crown Cola Co.

Norman A. Stepelton is new president of National Tea Co.

Beverly W. Warner has been named administrative v.-p. of Corn Products International and **William G. Palmroth** moves up to v.-p. in charge of operations in Africa and the Far East.

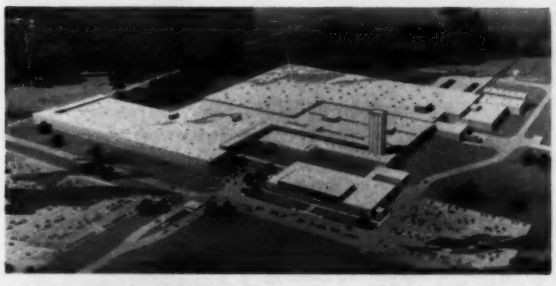
Dr. Max K. Horwitt, prominent nutrition scientist, has been awarded the '61 Osborne & Mendel Award by American Institute of Nutrition.

Industry

Gilroy Foods, Inc., California vegetable dehydration firm, has been acquired by **McCormick & Co., Inc.**

Gerber baby food products are expected to penetrate Japan's market in near future. Production and distribution will be handled by Japanese firm.

Pepsi-Cola International announced opening of its first plant in Nyasaland. This brings total Pepsi op-



MULTI MILLION DOLLAR TEXAS SIZE PLANT to be built by Campbell Soup Co. in Paris, Texas, is scheduled for completion in '63. Equipped for production of soup, bean, and spaghetti products, plant covers nearly one million square feet on 684 acres.

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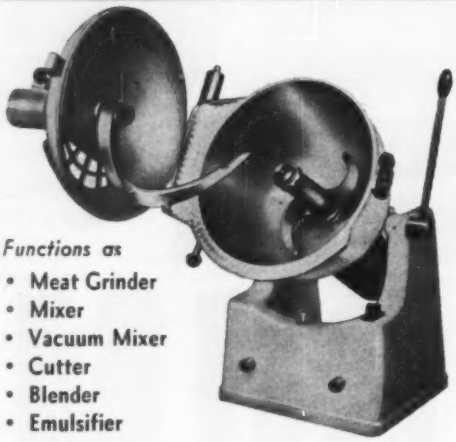

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erations outside of U. S. and Canada to 238 plants, with distribution in 87 territories and countries.

The Frito Co. has merger plans underway with **Austex Foods, Inc.** Proposal awaits stockholder approval.

Falstaff Brewing Corp. will purchase the malting and other physical properties of **Albert Schwill & Co.**, Chicago.

Beech-Nut Life Savers, Inc. plans acquisition of **J. Hungerford Smith Co.**, producer of products for soda fountain trade and ice cream manufactures.

Crosse & Blackwell Co. is now an operating unit of **The Nestle Co.** C&B was acquired by Nestle earlier this year.

Campbell Soup Co. completed construction of its new food and nutrition labs in Camden, N. J.

Consolidated Foods Corp. will build $1,300,000 addition to baking facilities at **Lawson Milk Co. Div.** in Cuyahoga Falls, O.

Rudd - Melikien, Inc. has acquired all outstanding stock of **Kwik Kafe Processors of America, Inc.**, coffee roasting and tea processing firm.

Holman R. Cloud, president of Coca-Cola's Minute Maid Div., was elected to parent firm's board and **Dr. C. A. Shillinglaw**, director of technical R&D was elected a company v.-p.

Associated Industries

Federal Paper Board Co., Inc., plans acquisition merger with **Worcester Paper Box Corp.**, Medford, Mass.

W. R. Grace & Co.'s Polymer Chemicals Div. has initiated a major expansion program to broaden its product line.

F. J. Stokes Corp., Phila-

Faster Freezing of Packaged Foods!

- Convenient "pass-through" operation
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- Available with or without cabinet

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Freze-Cel DOUBLE CONTACT PLATE FREEZER

DOLE THE Cel LINE

CIRCLE 118 ON INQUIRY CARD

CIRCLE 172 ON INQUIRY CARD

delphia, has established a subsidiary firm in Great Britain for manufacture of plastic molding and processing equipment.

John L. Gushman, former Owens-Illinois v.-p., has been elected president of Anchor Hocking Glass Corp.

Crown Cork & Seal Co., Inc., purchased RCA's electronic beverage inspection equipment business.

F. C. Hayes, president of Container Statistics, Ltd., takes over as president of Packaging Assn. of Canada.

Idaho Maryland Industries Inc., Los Angeles, has agreed to sell 50% of its **Liquefreese Corp. of America to Ward Industries Corp.,** New York, for $1,200,000.

Richard C. Fenton and **William Dechert** have been appointed v.-p.'s of International Subsidiaries of Chas. Pfizer & Co., Inc.

Monsanto Chemical Co. is increasing by 30% its polyethylene production facilities at Texas City, Tex., plant.

Hercules Powder Co. plans construction of second multi-million dollar polyolefins unit at Lake Charles, La.

The Mead Corp. has acquired controlling interest in Chatfield & Woods Co.

Lenvik Ylisaker moves up to research and engineering v.-p. at Continental Can Co.

Deaths

Joseph P. Duchaine, 58, president of My Bread Baking Co. and president of Quality Bakers of America Cooperative, Inc.

James McGowan Jr., 75, former president and board chairman of Campbell Soup Co.

Samuel C. Gale, 65, former v.-p. and advertising director for General Mills.

Sterling Morton, 75, board chairman of Morton Salt Co.

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they like best
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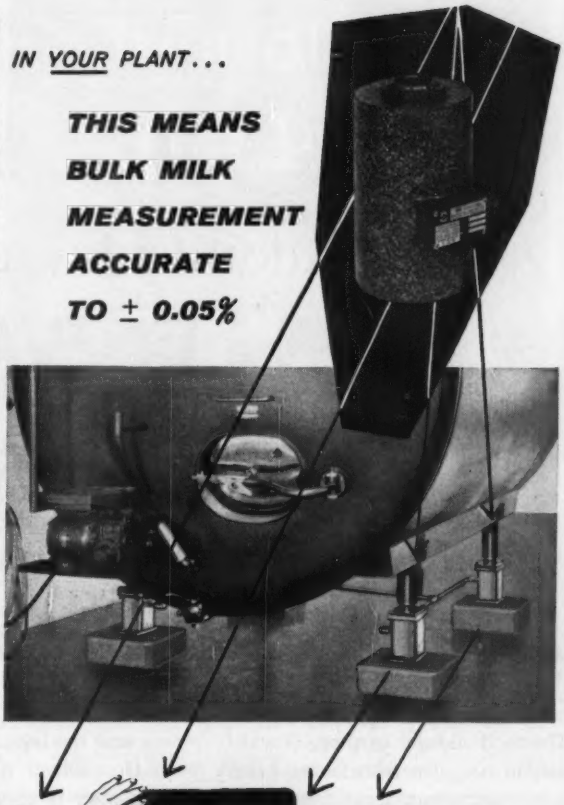

Greater profit today is the key to automation tomorrow. An SR-4 Milk Tank Weighing System, meeting rigid commercial "buy and sell" accuracies of the National Bureau of Standards, offers unmatched handling and operational economy now and will fit into any automated program you establish later.

Developed by Baldwin-Lima-Hamilton and available to the dairy and food industries exclusively from The Creamery Package Mfg. Company, the SR-4 system relies for its accuracy on tank-supporting strain gage load cells—similar to aircraft and missile equipment measuring movements to a millionth of an inch.

As milk is pumped in and out of the tank, the weights—accurate to 5/100 of 1%—are shown on a precisely engineered indicating instrument. The indicator serves as many as ten tanks—added at any time—and the entire system can be easily tied into a fully automated facility operated from a central dispatch system or central control board.

Write today for Bulletin; also information about the CP BUILDING BLOCK PLAN for dairy automation.

ANOTHER CP BUILDING BLOCK TO AUTOMATION

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DICALITE® TECHNICAL REPORT

DICALITE DEPARTMENT • GREAT LAKES CARBON CORPORATION • 612 SO. FLOWER ST., LOS ANGELES 17, CALIFORNIA

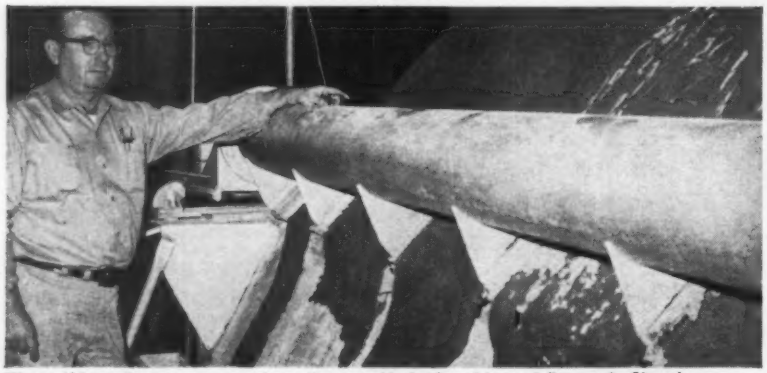
Unique Additive Filtration Discards Filtrate

Marty Harris, Dicalite engineer, reviews filtration procedure with A. H. Buck, plant manager, and R. C. Mosher, president of Barnett Laboratories.

The food additive carotene is widely used in margarine, shortening, bakery goods and pharmaceuticals where a natural yellow color and a high potency of vitamin A is desirable. A unique processing step, which might be called filtration in reverse, is employed by a leading producer of carotene – Barnett Laboratories, of Long Beach, California. Here, the liquid filtrate goes into cattle feed – and the valuable carotene is extracted from the filtered-out solids.

Barnett grows their own carrots . . . a special variety yielding at least twice as much carotene as the ordinary table variety, and taking twice as long to grow. After the carrots are crushed, the carotene is washed out and the liquid goes to filtration. A Dorr-Oliver rotary vacuum precoat filter is used, starting with an inch-and-a-half precoat of Dicalite Special Speedflow Filteraid. The knife is set for a minimum cut to remove the deposited carotene material with the least possible amount of filteraid. This material is flash dried and air conveyed to the final steps of solvent extraction and crystallization.

Dicalite, while helping Barnett work out their filtration problems, was also able to assist them in designing the flash drying air conveyor system. Careful consideration of the total process is typical of Dicalite service. We'd be glad to work with you.



The solid crude carotene coming off the knife is the object of Barnett's filtration.

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Dicalite's "Man on the Spot"

M. B. Harris

When Marty Harris first consulted with Barnett, they were not satisfied with their filter operation. His first step was to take samples of the carotene liquid to the Dicalite products laboratory for study. Then a series of tests was made on a miniature rotary precoat filter. Harris worked closely with a Barnett representative and the Dicalite research men on this project. His recommendations to Barnett resulted in marked improvement in filtering efficiency. Today, after continued study and improvements worked out with Barnett, the firm is getting more than double the production per hour from the same filter.

Harris graduated from the University of Idaho with a Ch.E. degree, and worked for some time with American Potash & Chemical Corporation. For the first 2 years after joining Dicalite in 1945 he worked in the laboratory on research and customer service, before going into the field as District Manager, first in San Francisco and then in Philadelphia. He now serves Dicalite customers throughout the Southwest.

Marty is entitled to add P.E. after his name, for he holds a California State license as a Professional Chemical Engineer. He has contributed articles on filtration to publications in the petroleum, sugar and swimming pool fields, and is a member of the American Chemical Society, AIChE, Master Brewers Association of America, the American Institute of Sugar Beet Technologists and the Papermakers and Associates of Southern California.

TECHNICAL LITERATURE

on Dicalite Filteraids is available on request. Bulletin B-14 discusses the principles and operating practices of filteraid filtration, and its applications in many industries.

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PLATECOIL. Describes how new multi-zone unit gives cost-cutting advantages over pipe coils, plus new improvements bonus. 8p.—Tranter Mfg., Inc., Lansing, Mich. **(211)**

POSITIVE-FLOW BOILER. Provides details on construction, specifications, and operation of high-efficiency gas/oil firing boiler.—Orr & Sembower, Inc., Reading, Pa. **(212)**

MOTORDRIVES. Covers firm's complete line, ¼ through 40 hp., including full rating tables, new output speeds. 88p.—Reliance Electric & Engineering Co., Cleveland. **(213)**

GLASSED PIPE. Describes glassed-metal pipe, valves, and fittings for corrosion resistance and less product contamination.—Pfaudler Permutit, Inc., Rochester, N. Y. **(214)**

CENTRIFUGAL PUMPS. Details horizontal, single-stage units, including photos and specs on new parts interchange. 15p.—Goulds Pumps, Inc., Seneca Falls, N. Y. **(215)**

CONDULETS. Discusses condulets and National Electrical Code, detailing applications of units in hazardous locations. 60p.—Crouse-Hinds Co., Syracuse, N. Y. **(216)**

BEARINGS. Complete table of specs and sizes available are included for standard cylindrical and flange, oilless units. 12p.—Arguto Oilless Bearing Co., Philadelphia. **(217)**

IMMERSION HEATERS. Provides illustrations and specs of units for all applications in variety of materials for free flow and circulation of heated solution around and through bundles.—Heatrex, Inc., Meadville, Pa. **(218)**

MOTORS. Includes technical data, illustrations, and descriptions of new line of right-angle worm gear units for maximum performance in wide range of load requirements. 6p.—U. S. Electrical Motors, Inc., Los Angeles. **(219)**

TUBE-O-MATIC. Illustrated bulletin gives details on new approach in valve design, originated to solve problems of valve wear and maintenance in controlling corrosive fluids. 4p.—Airmatic Valve, Inc., Cleveland. **(220)**

TEFLON. Shows how to use sheets, rods, tubes, tape, and other standard shapes of "Teflon" TFE-fluorocarbon resins. 8p.—Cadillac Plastic & Chemical Co., Detroit. **(221)**

THERMOS-COUPLE. Completely describes a truly sanitary temperature sensing element for in-line food processing applications.—Minneapolis-Honeywell, Philadelphia. **(222)**

ATOMIZING NOZZLES. Gives applications, characteristics, construction, and operation of hollow-, and solid-cone units. 2p.—Schutte & Koerting Co., Cornwells Heights, Pa. **(223)**

HOT WATER CONVERTERS. Lists complete specs covering 114 models in 2-, and 4-pass arrangements, including descriptions of shell construction. 20p.—Niagara Weldments, Inc., Niagara Falls, N. Y. **(224)**

SLUDGE COLLECTORS. Provides data which enables proper selection of tank size, plus mechanical details and drawings of available designs. 28p.—Link-Belt Co., Chicago. **(236)**

PROCESSING

PROCESS PLANNER. Describes and illustrates unit for control of automated clean-in-place, and automated processing schedules.—Wizard Gauge Co., Los Angeles. **(225)**

ALUMINUM COOKING UTENSILS. Details complete line of aluminum industrial equipment and utensils. 88p.—Wear-Ever Aluminum, Inc., New Kensington, Pa. **(226)**

EGG HANDLING SYSTEM. Contains illustrations and detailed descriptions of operating characteristics of new unit with "memory" for automatic control. 16p.—Food Machinery & Chemical Corp., Riverside, Calif. **(227)**

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WATER STILLS. Details latest design of firm's units built of non-contamination materials for high purity distillation. 4p.—F. J. Stokes Corp., Philadelphia. **(228)**

CENTRIFUGALS. Includes illustrations, specs, and construction details of "Center-Slung" types. 20p.—American Machine & Metals Inc., East Moline, Ill. **(229)**

FREEZE DRYING. Provides complete information on firm's equipment, supplies, and services, including cross-sectional diagrams. 38p.—Vickers-Armstrongs (South Marston) Ltd., London. **(230)**

JET COOKING SYSTEM. Describes latest applications of firm's system that does away with batch starch cooking difficulties. 20p.—A. E. Staley Mfg. Co., Decatur, Ill. **(231)**

BLENDERS. Describes and illustrates new ribbon blenders in heavy duty sanitary design for thorough mixing and heat transfer. 4p.—First Machinery Corp., Brooklyn, N. Y. **(232)**

PULVERIZERS. Technical catalog gives illustrations and specs of heavy duty hammer mills, and screen type pulverizers. 8p.—Young Machinery Co., Muncy, Pa. **(233)**

CONTINUOUS INGREDIENT FEEDER. Details an all stainless steel unit for continuous and accurate addition of fruits, nuts, candies, purees, etc., to ice cream and frozen desserts. 2p.—Creamery Package Mfg. Co., Chicago. **(234)**

ULTRASONIC HOMOGENIZERS. Introduces new unit that uses fluid dynamic forces of liquids themselves to produce the sound waves. 6p.—Sonic Engineering Corp., Stamford, Conn. **(235)**

PACKAGING

DISPENSING VALVES. Includes cataloged illustrations and technical data to assist in your selection and specification of valve and cover assemblies for food product containers. 6p.—Clayton Corp., St. Louis. **(239)**

SETUP PAPER BOX MACHINERY. Provides illustrations and specs of complete line, including explanations on quad stayers, gluers, wrappers, box stackers, flange benders, shapers, and transparent lid forming machine. 4p.—Food Machinery & Chemical Corp., Philadelphia. **(240)**

CELLOPHANES. Gives a concise description of "K" series polymer-coated films and their advantages to the packager, including tips on how to handle material. 4p.—E. I. du Pont de Nemours & Co., Wilmington, Del. **(241)**

FILM WRAPPING AND SEALING. Describes unit that handles any type film and wraps 60 to 80 packages per minute in simple, efficient operation.—Crompton & Knowles Packaging Corp., Holyoke, Mass. **(242)**

CARTONING MACHINES. Fully details units that set up and close up to 90 cartons per minute, have fewer moving parts, and design simplicity. 6p.—Continental Can Co., NYC. **(243)**

FOIL COLOR COATINGS. Sample booklet of color coatings currently available on firm's line of foil containers, provides 15 decorative packaging ideas.—Ekco Alcoa Containers, Inc., Wheeling, Ill. **(244)**

(Turn page)

IF YOU MAKE THESE PRODUCTS:

dry mixes, cookies, crackers, cakes, pies, soups, sauces, gravies, frozen pies, ice cream, sherbet, confections, macaroni & cheese—or most any product calling for non-fat dairy solids . . .

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(Kraft's spray-dried sweet whey)

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Fine, True Flavor—Krafen's high milk sugar content and absence of casein works to bring out the natural flavor of all processed foods, frozen foods, ice cream, sherbets and baked goods—the flavor other dairy ingredients tend to mask!

For example, frozen food processors using Krafen no longer need "over-season" to maintain the flavor level.

Improved Eating Quality and Appearance—Krafen's combination of milk sugar and whey proteins gives added shortness and tenderness to all finished baked goods, whether ready-baked or from a mix . . . imparts finer texture and promotes a uniform, rich color and bloom.

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Savings of up to 5¢ a Pound—Replace your present dairy ingredient with Krafen. Save up to 5¢ a pound on dairy solids costs and be assured of superior performance. Krafen—a high-quality, low-bacteria, low-acid dairy ingredient—is produced by Kraft in one of the world's largest, most sanitary whey plants.

Ask your Kraft man or write to Kraft for a free sample of Krafen and complete data on its use in your products. Then test Krafen in your plant and look forward to great results!

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Plastic caps . . . pouring rings . . . sifter tops . . . liquid dispensers . . . collapsible metal tubes.

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NEW YORK, N. Y. Lackawanna 4-9715	CLEVELAND, OHIO Academy 6-5757	ST. LOUIS, MO. Parkview 7-7380
CHICAGO, ILL. Palisades 5-3020	CINCINNATI, OHIO Parkway 1-5736	LOS ANGELES, CALIF. Pleasant 2-0791

Just Off The Press (continued)

RELEASE PAPER COATINGS. Describes complete line of silicone coatings for release paper, including 7 new types. 16p.—General Electric, Waterford, N. Y. **(245)**

CAN LINE AUTOMATION. Handbook provides information on proximity controls—what they are, what they do, including data on full equipment line. 12p.—Peco Corp., Mountain View, Calif. **(246)**

UNIVERSAL SEALER. Details a low priced unit that seals polycel, all pliofilms, and poly coated kraft, as well as all gauges of polyethylene. 2p.—Packaging Equipment Co., Inc., Los Angeles. **(247)**

ALUMINUM FOIL CONTAINERS. Photographically illustrates in color many end uses of aluminum pans and containers. Gives detailed information on foil line available for food products. 16p.—Kaiser Aluminum & Chemical Corp., Oakland, Calif. **(248)**

SANITATION & MAINTENANCE

SANITARY WALL FINISH. "Sanitile," a new brush applied surface for concrete, brick, and similar rough surfaces, is fully described with in-use illustrations. —The Master Mechanics Co., Cleveland. **(251)**

DISPOSABLE WIPERS. Color brochure details "Kimwipes" —soft, highly-absorbent cellulose wipers for use wet or dry. Samples included with brochure. 12p.—Kimberly-Clark Corp., Neenah, Wis. **(252)**

INSECT-ELECTROCUTOR. Details unit guaranteed to fully protect any area from insects automatically with low-cost operation. 6p.—Sno-Master Mfg. Co., Baltimore. **(253)**

WASTE REDUCTION KIT. Employee cooperation in plant waste reduction campaigns is increased through use of wall posters and other visual materials provided in this kit.—Elliott Service Co., Inc., Mount Vernon, N. Y. **(254)**

POWDERED ACID CLEANER. Introduces product for cleaning scale deposits from boilers, water lines, pumps and other equipment. 4p.—Hagan Chemicals & Controls, Pittsburgh. **(255)**

CORROSION CONTROL SYSTEMS. Illustrated folder describes various types for protection and preventive maintenance of all metal surfaces.—Truscon Laboratories, Detroit. **(256)**

PLANT SANITATION PROGRAM. Tells how to have a custom engineered program for your plant through systematized approach to individual problems.—Klenzade Products, Inc., Beloit, Wis. **(257)**

CORROSION-PROOF FLOORS. Provides nine detailed drawings of typical engineered flooring installations and specs describing 13 elements utilized in corrosion-proofing.—The Ceilcote Co., Cleveland **(258)**

INGREDIENTS

NATURAL FERMENTATION FLAVOR. Provides formulations and complete details on natural fermentation flavor for use in baked goods. 10p.—Vico Products Co., Chicago. **(261)**

SWEET DAIRY WHEY. Gives information on this 100% dairy ingredient for improved product quality and lower ingredient costs.—Western Condensing Co., Appleton, Wis. **(262)**

SURFACE ACTIVE CHEMICALS. Illustrated brochure details antifoam agents, emulsifiers, and other surface active chemicals. 20p.—Hodag Chemical Corp., Skokie, Ill. **(263)**

MATERIALS HANDLING

SANITARY CONVEYOR BELT. Fully details new sanitary belting developed especially for food processing. Unit prohibits bacterial pocketing, sogginess, or rancidity. Ton-Tex Corp., Englewood, N. J. **(266)**

CUT HANDLING COSTS. Handbook discusses current material handling problems and provides cost cutting ideas for your operation.—Automatic Transportation Co., Chicago. **(267)**

VOLUMETRIC FEEDERS. Offers complete information on several models, plus data on feeder selection.—Wallace & Tiernan, Inc., Belleville, N. J. **(268)**

IN-TRANSIT REFRIGERATION. Describes "Polarstream" process—a revolutionary in-transit refrigeration system for perishable and frozen foods. 4p.—Linde Co., NYC. **(269)**

MATERIAL HANDLING AUTOMATION. Discusses automated material control for more efficient handling and cost reduction. 8p.—General Electric Co., Schenectady, N. Y. **(270)**

(Continued on page 152)

The Fruits of Knowledge in Flavor

Practical, cost-saving techniques in natural and artificial flavor development originate in the Kohnstamm laboratories. More than a century of experience can shed invaluable light on your present-day needs. Our book of flavor knowledge is open to you. Write today.

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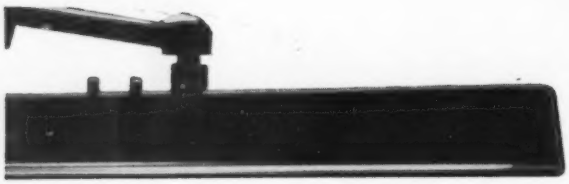
H. KOHNSTAMM & CO., INC.

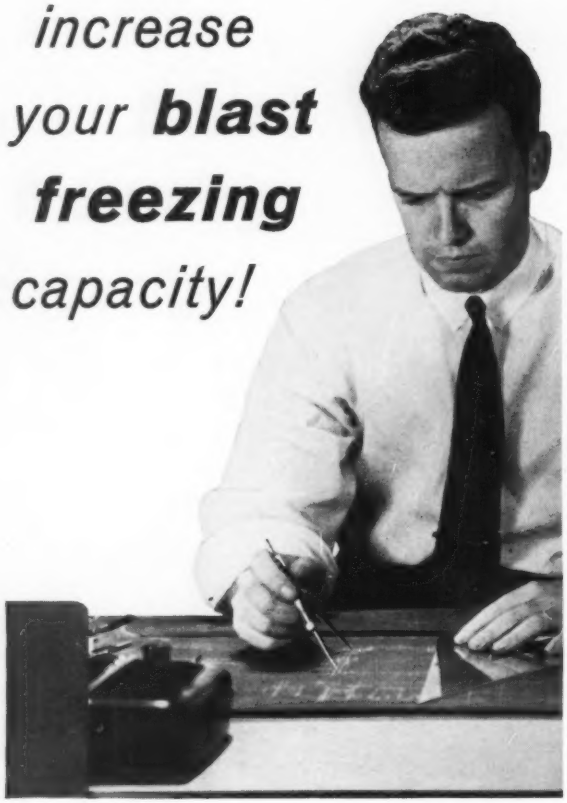
First producers of certified colors

161 AVENUE OF THE AMERICAS, NEW YORK 13, NEW YORK

11-13 E. Illinois St., Chicago 11; 2632 E. 54 St., Huntington Pk., Calif.



This man can increase your ***blast freezing*** *capacity!*



He's a King Company engineer . . . highly experienced and expertly trained to think creatively about the highly specialized field of blast freezing. His know-how comes from thousands of custom-designed cold room installations . . . for most of the nation's leading companies.

Let a King Company engineer help you plan a King Sharp Freeze system to meet your exact needs. Write today.

50 years of experience is at your service

SHARP FREEZE SYSTEMS

King 905 Cedar St.

COMPANY OF OWATONNA

OWATONNA, MINNESOTA

Just Off The Press (continued)

TROLLEY CONVEYORS. Shows what a trolley conveyor can do to reduce manufacturing and handling costs and how to select the right unit for any requirement. 57p.—Link-Belt Co., Chicago. **(271)**

BULK & PACKAGE HANDLING CONVEYORS. Gives illustrations of engineered systems, special applications, and specs of complete line. 57p.—Conveyor Systems, Inc., Morton Grove, Ill. **(272)**

SCREW CONVEYORS. Outlines equipment, installations, and components, including photos of typical installations. 150p.—Thomas Conveyor Co., Fort Worth, Tex. **(273)**

WALKIE. Outlines advantages and applications of new 2,000 lb. capacity unit with built-in charger. 6p.—Lewis-Shepard Products, Watertown, Mass. **(274)**

TRUCK SAVINGS. Shows how proper unit selection, operating and maintenance can produce substantial savings in the face of mounting transportation costs.—GMC Truck & Coach Div., Pontiac, Mich. **(275)**

INSTRUMENTS

ANALOG COMPUTER COMPONENTS. Catalog sheet covers firm's line, including illustrations, descriptions, and basic specs. 2p.—Embree Electronics Corp., West Hartford, Conn. **(280)**

IMPULSE COUNTER. Includes data on construction, application, installation, specialized functions, and basic circuit arrangements. 4p.—Automatic Timing & Controls, Inc., King of Prussia, Pa. **(281)**

ELECTRONIC CONTROLLERS. Covers complete line, both pneumatic and electric, including new design features, illustrations, and specs. 56p.—Minneapolis-Honeywell Regulator Co., Philadelphia. **(282)**

LIQUID LEVEL CONTROLS. Describes and illustrates firm's line of floatless types for use on high resistance liquids, low resistance liquids, and long distance applications from remote locations. 4p.—The BW Controller Corp., Birmingham, Mich. **(283)**

WEIGH-COUNTING SCALES. Provides information on heavy-duty units with gross capacity of 2½ tins to light units that handle pieces as small as 1/100th of an ounce.—Detecto Scales, Inc., Brooklyn, N.Y. **(284)**

MARKETING

CONSUMER PROMOTIONS. "18 Steps to More Profitable Consumer Promotions," reviews marketing objectives that are being reached with aid of consumer promotions. 12p.—A. C. Nielsen Co., Chicago. **(291)**

DISTILLERS MARKETING SURVEY. Summary pages and maps indicate consumption of various alcoholic beverage types, state by state, by the 18 to 64 age group. 66p.—Bureau of Advertising of the American Newspaper Publishers Assn., Inc., NYC. **(292)**

ARMED FORCES MARKETS. Series of six booklets details how to sell your products to the Armed Forces through MSSA. Each booklet covers different food products.—Military Subsistence Supply Agency, Chicago. **(293)**

EFFECTIVE SALESMANSHIP. Discusses how to build your reputation on service, how to sell your service, service contracts, and creative selling in small firms. 4p.—Small Business Administration, Washington, D. C. **(294)**

MANAGEMENT

PERSONNEL MOBILITY. Shows how firms can save valuable time of executives and skilled labor by eliminating in-plant hiking through new approach to personnel and payload mobility.—Victor Adding Machine Co., Chicago. **(301)**

SECONDARY BOYCOTTS. Contains 17 questions and answers concerning current legislation that protects you, your customers, and your employees from harassment by unions using secondary boycotts.—U. S. Chamber of Commerce, Washington, D. C. **(302)**

BUSINES COMMUNICATIONS. Gives details of large screen compatible color television in a national closed-circuit network, including the 50 largest U. S. markets.—Theater Network Television, Inc., NYC. **(303)**

TRUCK FLEET LEASING. Provides an analysis of truck operational costs and its determination of truck ownership or leasing. Includes pros and cons on both sides. 24p.—The Foundation for Management Research, Inc., Chicago. **(304)**

Are you giving your institutional customers the best packaging?

They can store food conveniently in Duraglas® institutional containers

Large-capacity Duraglas containers are designed for the institutional market. Food can be stored in the original container until it's all used. Glass is inert . . . won't affect taste or aroma. Caps, which are easy to remove, seal contents safely between servings.

Duraglas containers also provide a visual inventory of what's in the containers, and how much of it is left.

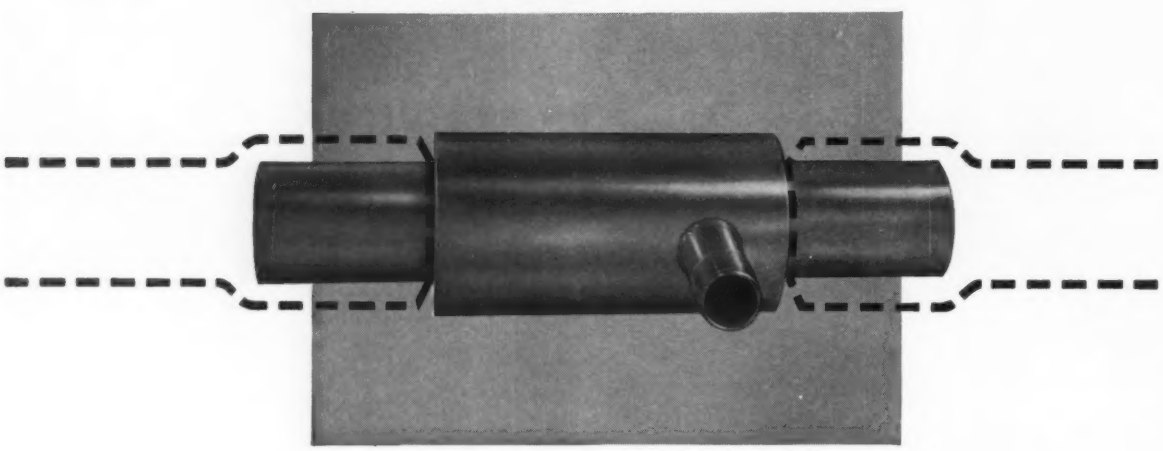
Offer your foods to the institutional trade in Duraglas packages. Let the package help you sell the product. Call your nearby O-I office today or write to Owens-Illinois, Toledo 1, Ohio.

DURAGLAS CONTAINERS
AN (I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO
PACIFIC COAST HEADQUARTERS • SAN FRANCISCO

NEW

THERMOS-COUPLE*



A temperature sensing element that's truly sanitary!

Engineered specifically for the food industry, the new Honeywell *Thermos-Couple* is the *only truly sanitary temperature sensing element* on the market today. Reason: there's absolutely nothing protruding into the line. No crevices or welds in contact with the product, either. And no matter how viscous your product is, the *Thermos-Couple* will accurately sense temperature.

To install the *Thermos-Couple* you need neither new tools nor special parts. You can use your standard sanitary fittings . . . or weld the unit in place. Since it contains no moving parts, the *Thermos-Couple* is practically service-free.

This new unit can be used wherever you want to measure a line temperature. A quick-connect plug or plug jack on the thermocouple wire lets you use up to 24 units for measuring as many points with one *ElectroniK* multi-point recorder. It's ideally suited for clean-in-place methods.

Get all the facts on the new Honeywell *Thermos-Couple*. See your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.—In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

*Trademark, Minneapolis-Honeywell Regulator Co.

Honeywell

First in Control

SINCE 1885

CIRCLE 128 ON INQUIRY CARD

CIRCLE 129 ON INQUIRY CARD →

MORE THAN A SUBSTITUTE

...DUPLICATES REAL

BEEF FLAVOR

Now leading manufacturers are replacing costlier materials and getting better flavor with MAGGI's Hydrolyzed Plant Proteins. MAGGI's *cleaner, clearer, meatier* flavor is always uniform. Its flavor is constant under all processing methods and it effects substantial savings in costs. This superior flavor is always dependable without variations in quality and taste. There are MAGGI's Hydrolyzed Plant Proteins that are perfect for use as basic flavors for beef, pork, veal, fowl or fish – to reinforce meat extracts and broth and as prime ingredients in soup and gravy bases. Technologists, who have developed the unique process for producing Hydrolyzed Plant Proteins, are available to assist you in your formulations. Write for free samples and data to: The Nestlé Company, Inc., Bulk Division, White Plains, New York.

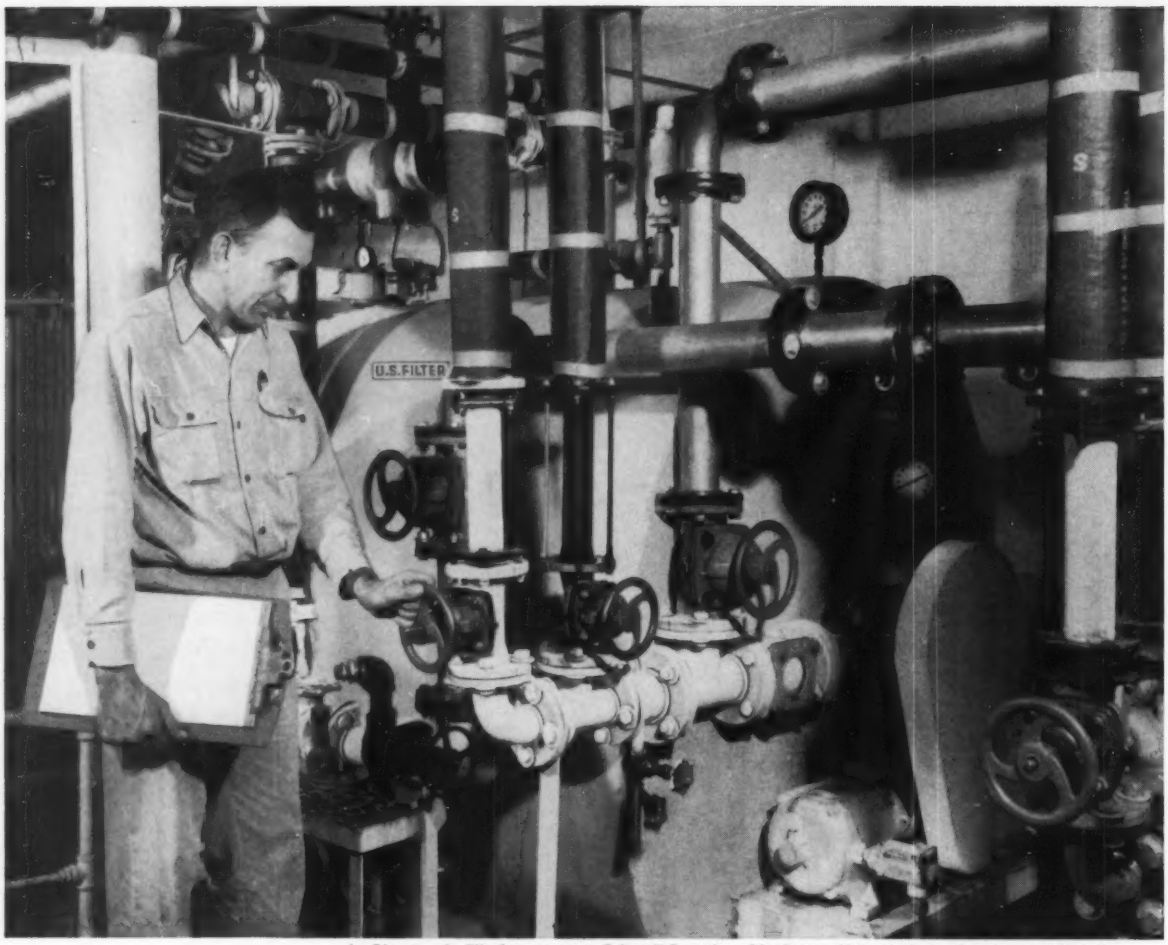
4-BE and 4BE-2 for BEEF FLAVOR
3H-1 for VEAL or PORK FLAVORS
3H-3 and 3H3-4 for FOWL or SEA FOOD
Available in Liquid, Paste or Powder Form

MAGGI'S®

HYDROLYZED PLANT PROTEINS

Prepared by the makers of world famous **MAGGI'S** *seasoning*

THE NESTLÉ COMPANY, INC.
WHITE PLAINS, N. Y.



In Glenmore's filtering process, Grinnell-Saunders Diaphragm Valves' streamline flow and isolation of bonnet mechanism guard product purity. Filtering unit manufactured by U. S. Filter Company.

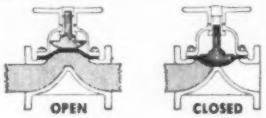
Even during filtration at sub-zero temperatures . . .

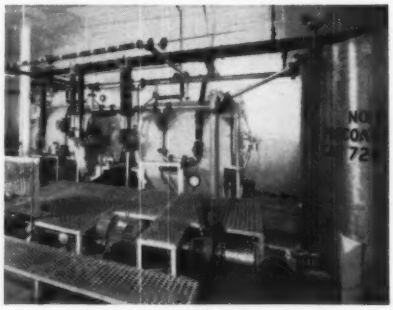
Grinnell-Saunders Diaphragm Valves keep whiskey sparkling clear for Glenmore Distilleries

Glenmore Distilleries Company reports that at their distillery in Owensboro, Ky., only Grinnell-Saunders Diaphragm Valves could safeguard clarity and also give proper control of flow in the filtering system.

Grinnell-Saunders Diaphragm Valves give the whiskey streamline flow . . . have no pockets to trap particles. What's more, the bonnet mechanism is *completely* isolated from the fluid in the line by the Teflon diaphragm. Result: clarity reading of 2 Nephelos, lowest in the industry!

You get a wide choice of body, lining and diaphragm materials with Grinnell-Saunders Diaphragm Valves. Learn how these dependable valves can help your production. Contact your nearest Grinnell office today.

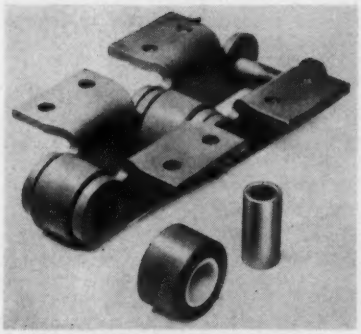




Here's where Glenmore filters whiskey at sub-zero temperatures.

GRINNELL COMPANY, PROVIDENCE 1, R. I. • BRANCH WAREHOUSES AND DISTRIBUTORS FROM COAST TO COAST
PIPE FITTINGS • VALVES • PIPE HANGERS • PREFABRICATED PIPING • UNIT HEATERS • PIPING SPECIALTIES

new equipment & supplies



Chain's Plastic Bushings Offer Many Advantages

Unsurpassed wear and corrosion resistance are cited as features of this steel conveyor chain, now equipped with bushed rollers of Delrin. This performance has been verified in a two-year field test.

A unique plastic, Delrin is highly resistant to moisture and retains strength and size when wet. It has high corrosion resistance and a low coefficient of friction. Rollers thus need little or no lubrication, operate quietly, and can be continuously cleaned with water at temperatures to 180F. They can also be steam cleaned when necessary.

Units (Chabelco) range from 3.0 to 6.0 pitch.—*Chain Belt Co., Milwaukee.*

Circle 401 on Inquiry Card

SERVICE CENTER

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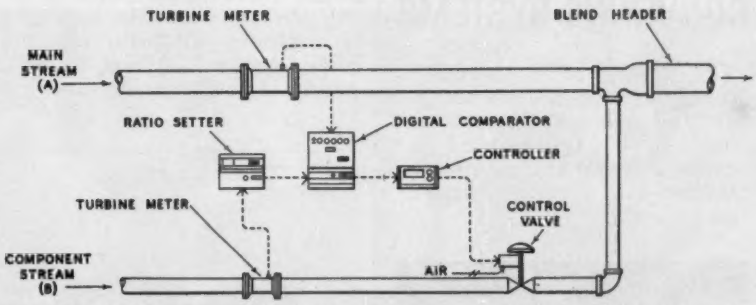


TWO-COMPONENT CONTROL: Digital comparator checks pre-set ratio of stream flows and actuates controller to maintain it.

Electronic System Monitors Blending

Precise control of product composition is offered by this continuous in-line blending system.

Employed in the unique setup is a combination of turbine-type flowmeters and electronic circuits that 'remember' the total amounts of each constituent of the blend. Control of each component stream is based on instant detection of any deviation from the required quantity.

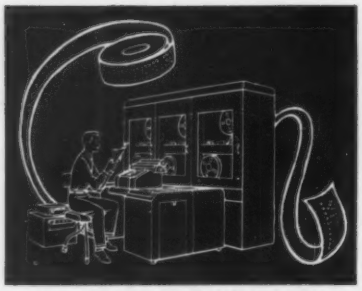
Thus, flow-ratio control is based on total quantity ratios, rather than instantaneous flow-rate ratios. Accuracy is reported to be ±0.5% of reading for each stream, repeatability is cited as ±0.2% or better.

The system has five basic components:

1. **Turbine flowmeters** develop a precise number of electrical pulses for discrete volumes of fluid gaged.
2. **Digital comparators** give a running total of cumulative count difference between pulses from two flowmeters or from a meter and pulse source.
3. **Ratio setters** accept incoming pulses and scale them up or down.
4. **Electronic controllers** accept a process signal input from the comparator in the form of an analog voltage, which is proportional to cumulative count difference. Controllers then compare this with a fixed set point representing 'zero' cumulative count difference, and position valves to bring the count difference in the comparator to zero.
5. **Diaphragm valves** assume positions dictated by the controller.

Two-component system control is illustrated by the above diagram: If total quantity ratio of the two flows is correct, as determined by the ratio setter, the digital comparator receives a zero count signal. Its analog voltage

COMPACT CONSOLE houses blending system's controls, indicators.



SPROUT-WALDRON PUTS DATA PROCESSING TO WORK TO SAVE YOU MONEY ON

PNEUMATIC CONVEYING SYSTEMS

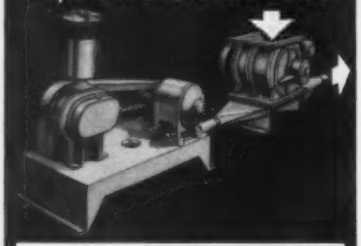
75% to 80% of all pneumatic conveying needs are now standardized systems. Component parts are manufactured in quantity and shipped from stock — *with the savings passed on to you!*

4

STANDARDIZED EASY-TO-ORDER

PACKAGED AIR SYSTEMS

stocked for immediate shipment at BIG SAVINGS



Write for Bulletin 228 showing standardized components, capacities, horsepower requirements — complete information on how to order without delay or outside assistance.

627

SPROUT-WALDRON

SINCE 1866

Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing & Blending
Bulk Materials Handling • Pelleting & Densifying

Equipment & Supplies (continued)

output represents zero cumulative count difference, which coincides with the setting of the set point of the controller. Thus, no control action takes place.

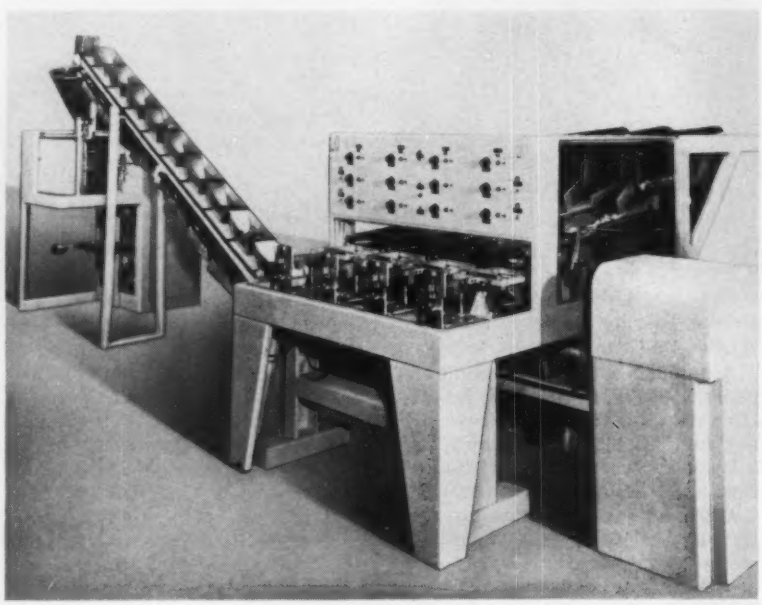
However, if main stream flow (A) starts to increase, the digital comparator immediately sees the count difference, indicating need for an equivalent increase in flow B counts to return the system to zero count difference. Instantaneously, the digital comparator develops a voltage signal that causes the process input to the controller to rise above the set point.

Immediate corrective action of the controller will further open the control valve in stream B. This generates additional pulses to make up the deficiency and develop zero cumulative difference on the comparator for the increased flow.—*Fischer & Porter Co., Warminster, Pa.*

FOR MORE INFORMATION...

... simply circle key item number on handy Inquiry Card—back of book. Then print your name and address, and mail. For your convenience, these items are also listed and keyed in Reader Inquiry section.

Circle 402 on Inquiry Card



High Scaling Accuracy Cuts Overweight Loss

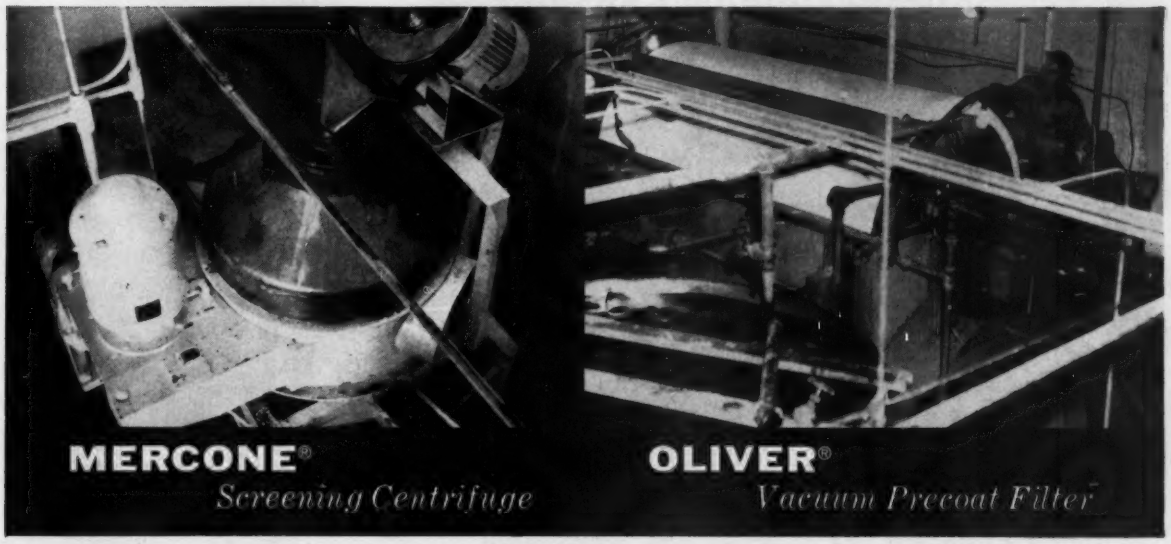
Extreme accuracy reported for this new scale system may cut overweight loss by as much as 75%.

Known as Merco-Weigher, it handles powders and small-diameter products, also larger objects such as cookies and lollipops. Length of feed from storage bins to scale is custom designed in inter-related sections to provide maximum feeding efficiency, depending on product. Thus with a package of 30 lollipops, over-weight can be held to less than ½ unit per package.

Dual dribble and bulk feeds, which run simultaneously in the last section, are operated by separate vibrators. This permits dribble feed to continue after bulk feed shuts off. Additional features include sensitive pivot points, lightweight aluminum balance and buckets, and scales with sensitive vernier adjustment mounted independently to eliminate vibration. Drop from scales to buckets is minimized to protect product, and automatic control prevents any scale from dumping until all are properly filled.

(Continued on page 135)

MODERN APPLE JUICE PROCESSING COMBINATION *cuts time... scores new highs in juice flavor!*



Continuous, automatic processing, instead of the traditional batch methods, now makes possible simplified, low cost production of clarified, full flavored apple juice. Key to successful operation is the combination of a Mercone Screening Centrifuge and an Oliver Vacuum Precoat Filter, shown above.

The Mercone Screening Centrifuge is a compact, completely enclosed stainless steel unit that provides instantaneous separation of pomace and juice by centrifugal action. Messy filter blankets are done away with as well as the manual labor involved with conventional presses.

Clarification of Mercone extracted juice is accomplished on the Oliver Precoat Filter, which presents to the fresh juice a clean precoat surface each revolution, for continuous removal of the extremely fine solids.

Processing from apples to clarified juice is done in minutes — eliminating losses of flavor and aroma.

Leading processors now using these units include the Duffy-Mott Company, manufacturers of Mott's Apple Juice, and the Sebastopol Cooperative Cannery of California.

For more information on application to your juice extraction problems, write Dorr-Oliver Incorporated, Stamford, Connecticut.

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WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

Miles has a way with FOOD:

TAKAMINE ENZYMES

...industry's biggest enzyme family made to fit your product's good taste

Exactly what does that mean to you?

A great deal. Producing the biggest enzyme family means that Takamine can recommend the precise *enzymatic activity* best suited to your particular job, whether it's starch conversion, proteolysis, removal of pectins, glucose or oxygen removal, or others.

Refined manufacturing techniques have resulted from this broad experience with enzymes. This means we can achieve the exact enzymatic activity required for specific jobs . . . *and maintain its uniformity*, batch after batch after batch.

So if you now use enzymes to enhance flavor, guard color and stability, lengthen shelf life or speed processing . . . or if you suspect you could use enzymes profitably . . . let us recommend a Takamine enzyme for the job. We don't believe you can find enzymes more precisely matched to your needs anywhere.

T-2-1

MILES Chemical Company

TAKAMINE®

Division of Miles Laboratories, Inc. Elkhart, Indiana—COngress 4-3111
Clifton, N. J. – PRescott 9-4776 • New York, N. Y. – MUrray Hill 2-7970

Units are constructed in batteries of two to six, for overhead or ground installation (as illustrated). —*Mercury Heat Sealing Equipment Co., Philadelphia.*

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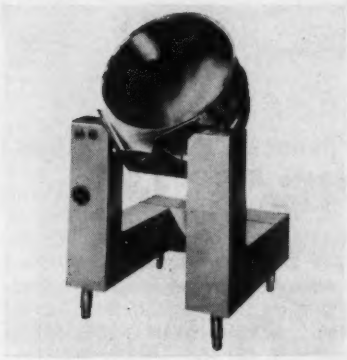


Powered Tilting Kettle

Easier pouring and improved sanitation are features of this electric-powered, steam-jacketed tilting kettle.

Tilting from the front edge, the wide lip stays in one pouring position for better control. Compact kettle tilts only when operator holds a finger on a pushbutton. With front lip at a high pouring level, mobile carts are easily used right at the kettle.

Unit is mounted on 6-in. sanitary tubular legs for easier cleaning around and under it. All steam pipes and electrical conduit are fully encased in the stainless-steel housing.

Steam input is regulated by a single valve on face of housing. First units to be offered have 40-gal. capacity. Lift-off cover or one of hinged, counter-balanced design will be optionally available.—*Groen Mfg. Co., Elk Grove Village, Ill.*

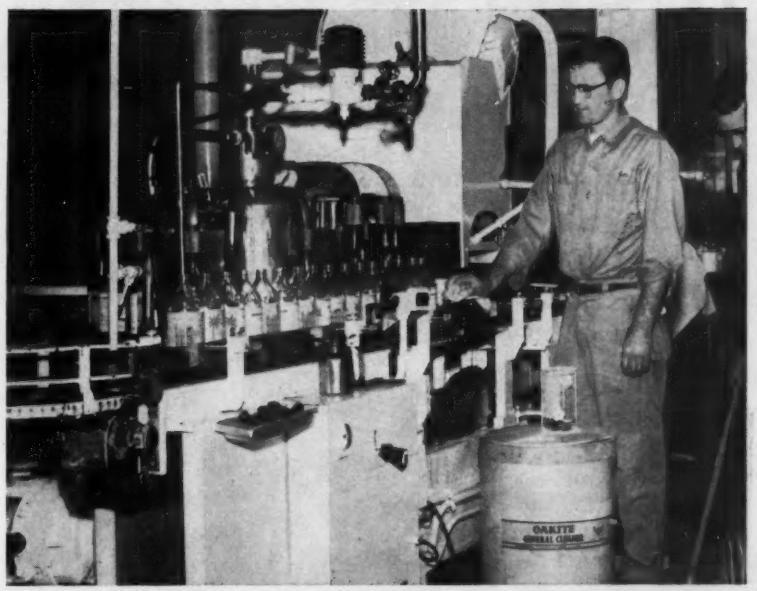
Circle 404 on Inquiry Card

Bi-Metal Thermometer For Checking, Control

Accurate measurement and control of wall temperature is offered by a new line of magnetically attaching bi-metal dial thermometers. Designed for ferrous materials, applications include tank and pipe process control and checks, and heat loss determinations across furnace, oven, and steel walls.

Three styles include: (1) Units for temperature measurement only,

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite



Cleaning in-place cuts downtime from a week to an hour for canner

IN-PLACE CLEANING with modern Oakite materials produces truly remarkable results. For example:

Juice lines at one packing plant had become so caked with grape juice residue that black specks appeared in lighter colored runs. Half of the lines were dismantled and several men spent *a week* cleaning them manually.

Then the Oakite man urged in-place cleaning of the remaining half of the lines. A heated Oakite solution was circulated for 35 minutes through the pipes, which were then flushed. Results: *100% clean*—all in less than an hour.

The big PLUS in Oakite

Working with Oakite brings you the latest information on mechanized cleaning methods, on products that do the job. It means an end to waste of time and materials. It provides the advantages of constant cleaning research . . . a wealth of experience . . . *guaranteed* performance.

Ask your local Oakite man to demonstrate in your own plant, or send for Bulletin F-9414, which gives details. Oakite Products, Inc., 26G Rector St., New York 6, N. Y.

OAKITE

over 50 Est. 1909 SCIENCE years' leadership in industrial cleaning

CIRCLE 135 ON INQUIRY CARD

taste maker

FOR LIPTON SOUPS...

BAKON®

HICKORY-SMOKED YEAST...

Soup sippers are a fussy sort; they want both the rich green pea taste and an exciting blend of seasoning. Lipton finds that hickory-smoked BAKON YEAST helps provide a zestful bacon-like flavor and nutrition as well.

Food technologists appreciate the fact that BAKON is a Dried Torula Yeast, salt-free, and a carrier of 50% protein, the entire vitamin B complex, and the amino acids. Genuinely smoked BAKON is stable, uniform and contains no starch, sugar, or meat.

Discover for yourself why so many important food firms now incorporate hickory-smoked BAKON YEAST into their products for extra flavor and sales-appeal. BAKON is now used to flavor baby foods, nibbling foods, stews and vegetables, baked goods, sea foods, cheeses, spice mixes, and seasoning blends.

Lake States

Manufactured and distributed for Bakon Yeast, Inc. by

Send for your complimentary test sample of BAKON YEAST

Lake States Yeast and Chemical Division
of St. Regis Paper Company • Rhinelander, Wisconsin
Sales Office: 420 Lexington Ave., New York 17, N.Y.

(2) with maximum reset hand, and (3) with electric contactor to permit 'on-off' temperature control for electric resistance heating. Temperature ranges are —60F to 700F, accuracy is better than 2%. Units are held to steel and other ferrous materials by permanent Al-Ni-Co magnets.—*Industrial Service Co., Providence, R. I.*

Circle 405 on Inquiry Card

Advanced 'Reefer' Design Meets AFDOUS Code

A solution to the problem of maintaining below-zero temperatures for frozen foods in transport is seen in a trailer with a new refrigeration system, and so insulated that it holds —10 to —20F. for at least five days.

Moreover, the same method of insulation can be used to modernize existing refrigerator trailers which do not hold low temperatures for as long as necessary. This removes the threat of obsolescence to some 80,000 trailers now in service.

Called Rail-Trailer, the new 40-ft. unit will employ a dry-ice recirculation system and foamed-urethane insulation.—*Rail-Trailer Co., Chicago.*

Circle 406 on Inquiry Card

Self-Loading Packer Ups Waste-Disposal Efficiency

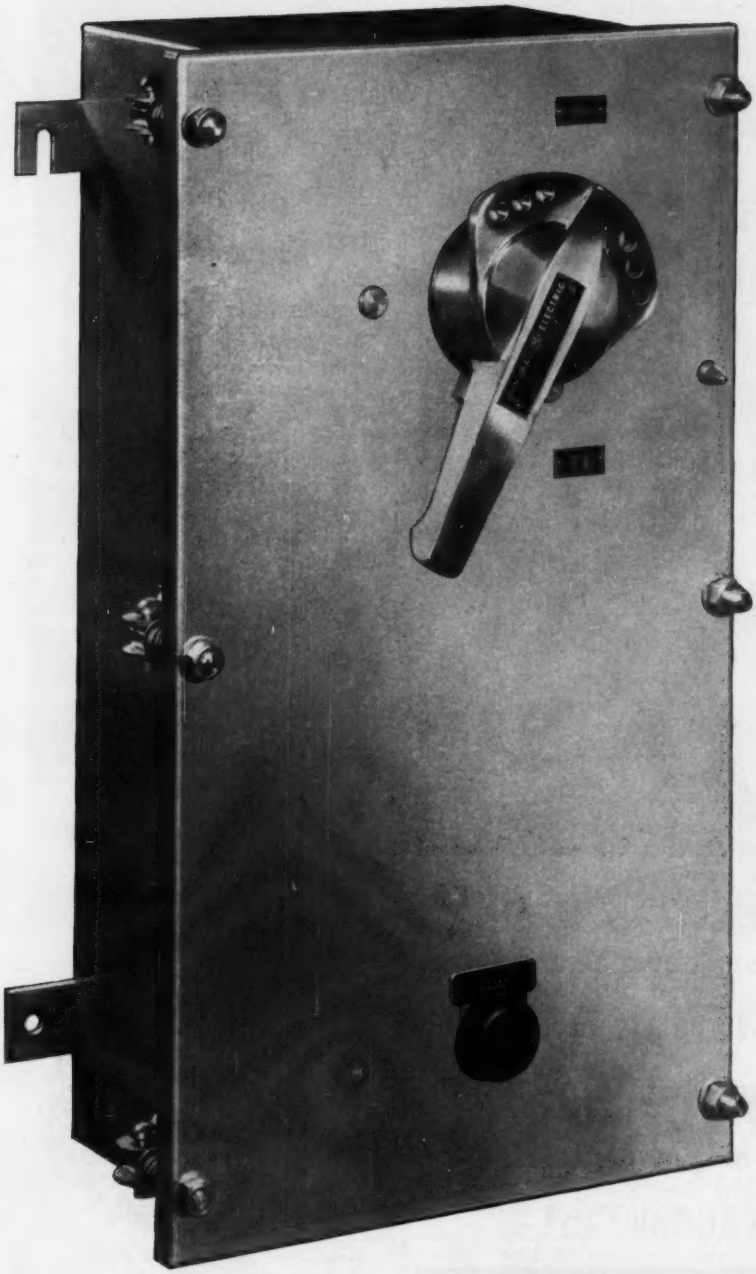
This self-loading packer collects refuse from maker's special containers, thus easily enables converting an existing container system to on-the-spot collection. This eliminates long hauls to disposal areas with individual containers.

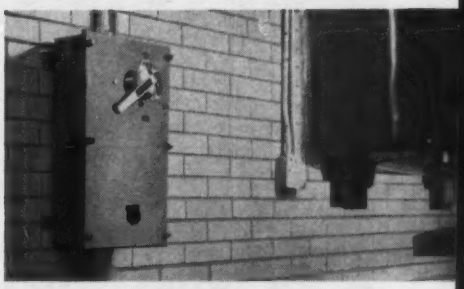
Kits and instructions for conversion of old containers are available. Kits consist of new lids and

(Continued on page 138)

FROM GENERAL ELECTRIC . . .

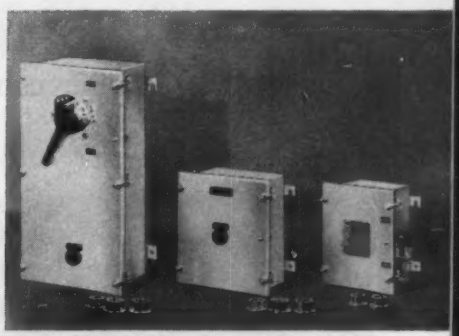
Stainless Steel Enclosures Eliminate Corrosion on Watertight Applications





Better appearance with no maintenance—Brushed satin finish of General Electric enclosures matches your other stainless equipment, saves you maintenance costs because it never requires painting. You can clean it with a hose without affecting finish. High-nickel stainless steel (Type #302) enclosure has tremendous corrosion and rust resistance.

Simplified installation and greater accessibility—Mounting brackets have keyhole slots allowing you to hang enclosure over screws while tightening. You can locate conduit openings where convenient because *separate* chromium-plated watertight hubs are supplied. Conduit holes are not "cast-in" as on NEMA IV enclosures. Cover is hinged—you don't need to remove it to perform routine inspection and maintenance.



Forms available—You get fast shipment on all forms: CR1062 integral hp manual starters; and CR106, CR7006 across-the-line magnetic starters, or CR107, CR108 and CR7008 combination magnetic starters, in NEMA Sizes 0 through 5.

Now you can eliminate the corrosion and maintenance problems common with cast-iron starter enclosures, and get the appearance and sanitation benefits of stainless steel enclosed starters . . . for all watertight applications. Ask your G-E sales engineer or distributor today, or write for publication GEA-7324, Section 813-38, General Electric, Schenectady 5, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

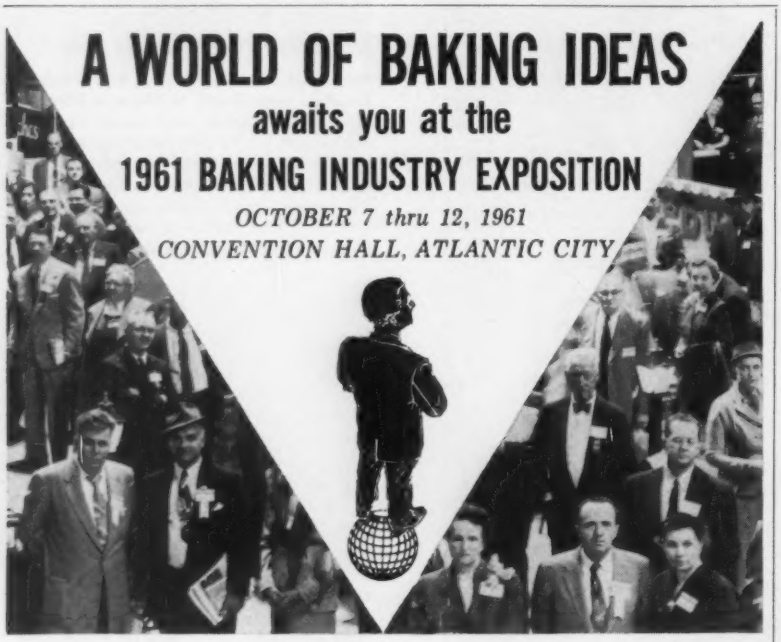
CIRCLE 137 ON INQUIRY CARD

container-handling side channels which can be easily and quickly welded into place.

The new collector has two truck-mounted clearance arms which empty containers into the hopper opening of a 30-cu. yd. compaction body. Here, material is subjected to 85,000 lb. of thrust developed by a hydraulic packer plate. Depending upon character and density of material, packer can haul the equivalent of 120 cu. yds. of refuse per trip.

All collection is handled by one man, the driver. In operation, packer approaches each container in turn, engages the side channels with its lifting forks, raises the container, rotates it over the hopper opening, and empties it.—*Dempster Brothers, Inc., Knoxville, Tenn.*

Circle 407 on Inquiry Card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AMERICAN BAKERS ASSOCIATION, 20 N. Wacker Drive, Chicago 6, Ill.

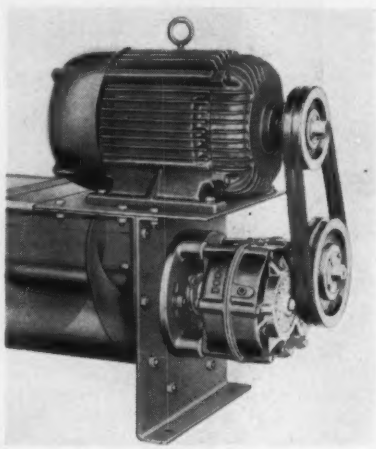
Speeds Belt Lacing

Using a 6-in. air cylinder, this belting lacer embeds hooks firmly and securely to make a joint reportedly as durable as the pieces joined. Hooks are driven flush with the surface. All strain is distributed evenly across the complete joint.

Designed for air pressure of at least 80 psi, unit (Speed Lacer) is foot operated, leaving both hands free for belt placement. One operator can produce flexible joints up to 12-in. wide in one easy operation. Wider joints are readily made by repeating the procedure.

Models available in 8 and 12 in. capacity are designed for lacing of wider belts.—*Clipper Belt Lacer Co., Grand Rapids, Mich.*

Circle 408 on Inquiry Card



Efficient Drive For Short Screw Conveyors

This compact screw-conveyor drive is designed especially for short conveyor flights and low horsepower requirements.

Known as Series 100, units are

(Continued on page 142)

Photo courtesy of The Frito Company

Another customer admires Koroseal's lack of taste

THESE corn chips are on their way from deep fat fryers to packaging machines. At one time belts made of canvas were used for jobs like this. But cooking oil clinging to the chips soaked into the canvas, stained it, sometimes made it rancid. Keeping these belts clean was next to impossible.

Then B.F.Goodrich developed an entirely new kind of conveyor belt made of Koroseal vinyl. This belt stands oil, grease, salt, heat, and just about everything else that ruins ordinary belts. What's more, Koroseal belts have no taste, no odor, and no harmful ingredients to transfer to food. They resist cracking and peeling, never get soft and sticky. And since oil can't soak into Koroseal's smooth, polished surface, this B.F.Goodrich belt is as easy to wash clean as your dishes at home.

The Koroseal belt is typical of the many products developed by B.F.Goodrich for fast clean handling of food products. If you would like to know more about the different conveyor belts, or special kinds of hose for handling syrup, molasses, flour, or rigid vinyl pipe that acids can't ruin, talk to your BFG distributor. As a factory-trained specialist in rubber products, he can answer your questions about any of the products B.F.Goodrich makes for food processing plants. *B.F.Goodrich Industrial Products Co., Dept. M-105, Akron 18, Ohio.*

Koroseal—T.M.Reg. U.S. Pat. Off.

B.F.Goodrich

CONVEYOR BELTS

It is an excellent lubricant. And it is *edible.*

Here is one of a unique class of products, *Myvacet®* *Distilled Acetylated Monoglycerides.* This edible lubricant has never been used in food equipment. Now it can be.*

Its wholesomeness recommends it as a divider oil, pan grease, or slab oil.

It is a good gear and bearing lubricant, even under high pressures. On cutting knives it works well, lasts and lasts.

*U.S. Food & Drug Regulations, Sec. 121.1018

It outperforms previously known edible oils in resistance to oxidation. And it's free from taste and odor.

For samples and more information on the various types and viscosities of *Myvacet Distilled Acetylated Monoglycerides* available, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

producers of Myvacet®
Distilled Acetylated Monoglycerides

DPi

Also . . . Myverol® Distilled Monoglycerides . . .
vitamin A for foods and pharmaceuticals

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Foot throttle-controlled lift and tilt.

Seat hinges back for easy side or overhead battery removal.

Drive wheel and motor accessible for servicing.

NEW compact electric truck by AUTOMATIC®

- ★ Works in congested areas with ease.
- ★ Gives you speed where it counts—in traveling and stacking.
- ★ Maximum accessibility for easy servicing.
- ★ Adjustable foam rubber ventilated seat for extra driving comfort.
- ★ Class H Silicone insulated motors exclusive with AUTOMATIC.
- ★ Capacities 2000, 2500 and 3000 lbs.

Here's a new counterbalanced truck that can speed up handling of goods in narrow aisles, trailer trucks and on crowded docks. The model RST is ideally suited for warehouse operations, light industry, and retail supermarket handling. Pallet loads of groceries can be moved directly into the store. Compact design, short turning radius and good weight distribution make an outstanding unit for working inside trailer trucks or in buildings with limited floor capacities. Even the price is compact! Get the details—mail coupon.

AUTOMATIC

AUTOMATIC TRANSPORTATION COMPANY
Division of The Yale and Towne Manufacturing Company
125 W. 87th Street, Dept. El, Chicago 20, Illinois

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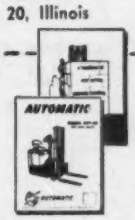


☐ Please send specifications on new compact electric truck, Model RST.

☐ Please send "Handbook of Cost-Cutting Materials Handling Ideas."

☐ Please have representative call me for appointment.

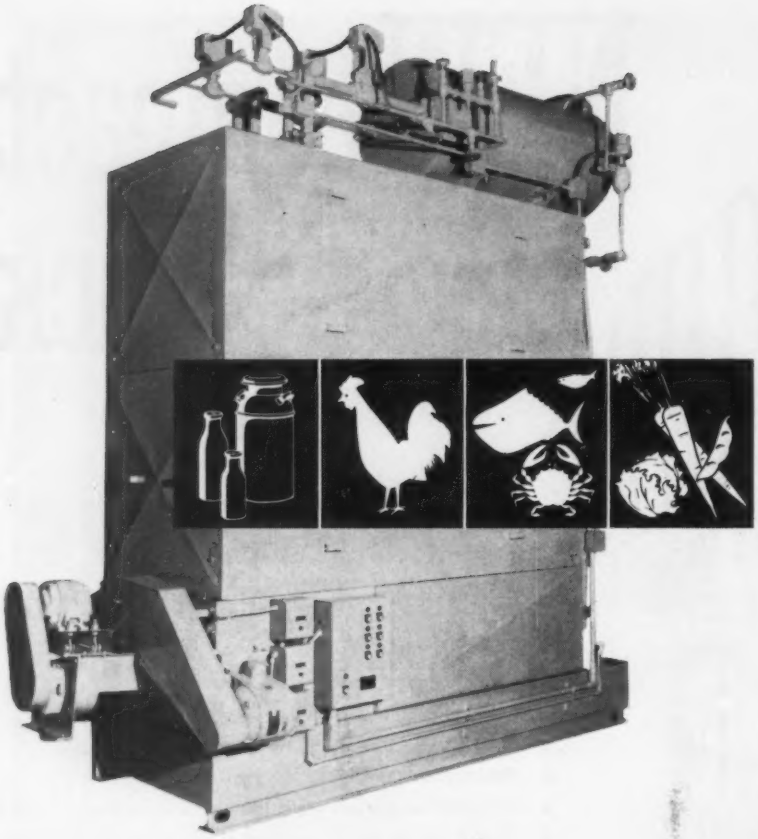
Name_____ Title_____

Company_____

Street_____

City_____ Zone____ State_____

CIRCLE 141 ON INQUIRY CARD



New Kohlenberger

KRAKICE MAKER

Solves Any Crushed Ice Requirement

Milk products, poultry, fish, vegetables...
Wherever crushed ice is used there's a place
for Kohlenberger's new Krakice Maker.
Now you can get higher ice yield per cubic ft. of space
occupied. Kohlenberger's Krakice Maker delivers clearer
crushed ice in larger quantities faster than conventional
models. No fine adjustments are necessary and
the need for knives or scrapers to remove ice from plates
has been eliminated. Available in 15, 30, 45 and
60 ton units. Write for detailed information.

When quality and dependability count... contact Kohlenberger!

Kohlenberger services include:
Equipment Manufacture • Refrigeration System Design
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KOHLENBERGER ENGINEERING CORPORATION
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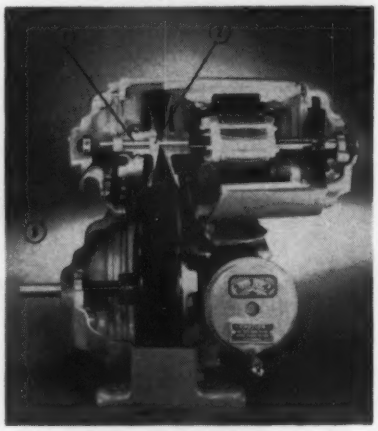
Equipment & Supplies

offered in two speed ratios: 8:1 for up to 6 hp. at 225 rpm., and 18:1 for up to 3.8 hp. at 100 rpm. They consist of a double-reduction speed reducer with packing gland and driving shaft which mounts on a trough end. Trough ends are also available.

Special design triple-seals the reducer unit against materials being conveyed. Packing gland is adjustable from the outside, takes standard packing, and may be inspected by sight. Slotted holes in reducer's flange permit rotating the unit for quick, easy adjustment of V-belt-drive center distances.

Heavy-duty tapered roller bearings in the reducer take thrust from the screw in either direction. Driving shaft is mounted in a steel sleeve, and a built-in puller facilitates changing the shaft without opening the reducer. Entire drive is easily mounted or removed from trough end with three bolts in the reducer's flange.—*Dodge Mfg. Corp., Mishawaka, Ind.*

Circle 409 on Inquiry Card



Variable-Speed Drive Needs No Lubrication

Lubrication is no problem with this variable-speed drive—it doesn't need any.

Called "Lube-Free," its special construction eliminates the three major lube points, as shown above:

1. Keys are made of tough elastic material that eliminates key and keyway wear.

2. Wear-resistant, non-metallic bushings need no lubrication, and

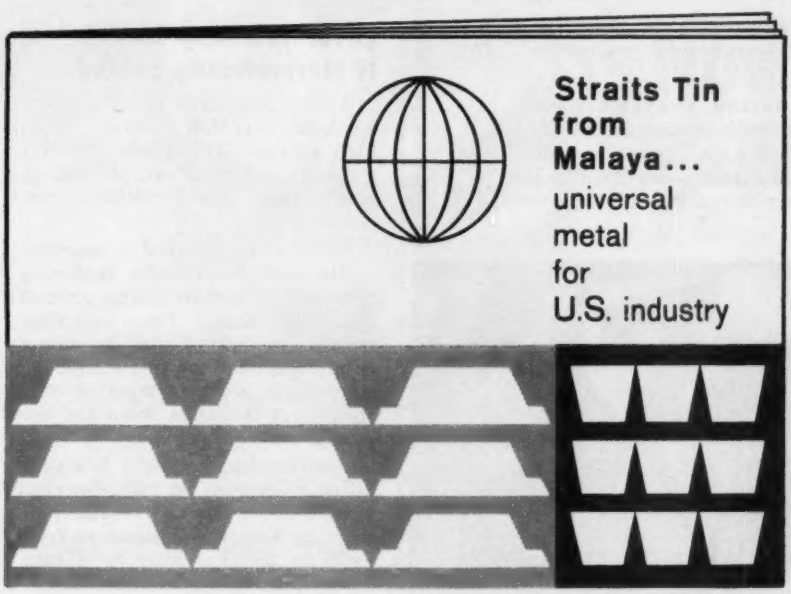
3. Shaft surfaces are impregnated with a special wear-resistant, corrosion-proof material.

There is no corrosion of load-

(Continued on page 144)

Read this free informative brochure about the latest uses of tin in these fields—

- FOOD PROCESSING
- BEVERAGES
- PACKAGING
- DESIGN
- METALWORKING



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2000 K St., N.W., Washington 6, D.C.

WHY GAS PACKAGING IS GROWING

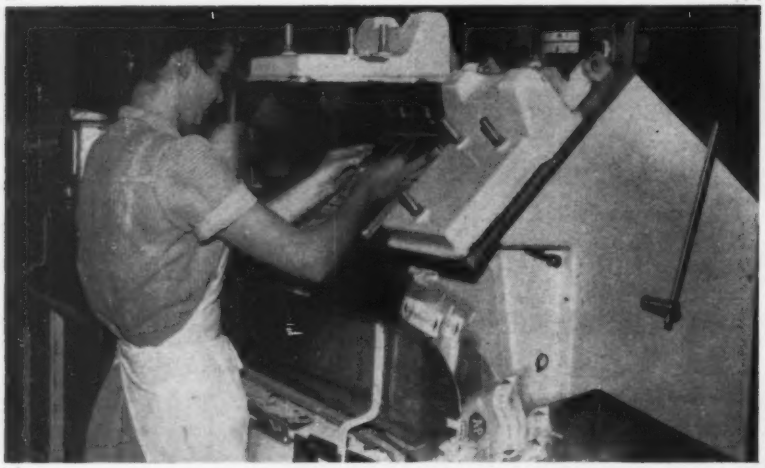
More food manufacturers are converting to inert gas packaging to get longer, more positive protection that assures freshness and color.

BULK HANDLERS shipping and storing fruits and vegetables under a blanket of inert gas report they can detect no degradation in a product so protected.

COFFEE, CHEESES AND MEATS . . . products dependent on freshness are now being packaged this modern way with excellent results.

SILO STORAGE of alfala under a protective gas blanket has become general practice in the farm belt.

PACKAGED GENERATION SYSTEMS have paved the way for the increased use of gas for they have brought gas prices in line where even the smaller processors can afford to produce their own atmospheres.



GAS ATMOSPHERES originated the packaged unit and is a leader in the design and development of complete systems for the production of high purity nitrogen, carbon dioxide, hydrogen, inert, reducing and annealing gases, dryers and purification equipment.

To get further information on generation equipment for your specific application write *Gas Atmospheres, Inc., 3855 West 150th Street, Cleveland 11, Ohio.*

gas Atmospheres, inc

4132

BETTER PACKAGING BETTER PACKAGING BETTER PACKAGING

Now! TART gelled sauces!

Make them with the only pectin that gells without sugar

Imagine—a tangy gelled fruit sauce! Many new, and saleable gelled food products are made possible by EXCHANGE LOW METHOXYL PECTIN—the *only* pectin that forms a true gel without the need for sugar.

With L. M. Pectin you can produce a full line of gelled foods of any degree of sweetness—even sugar-free for diabetics and low-calorie dieters. Use it for aspics, relishes, low-calorie jams, fruit jells and desserts. They'll stay firm at room temperature, yet be tender, elastic and sparkingly brilliant.

Get full information—including technical data and formulas. Call your Sunkist man or mail the coupon today.

Sunkist Growers

Products Sales Dept., 720 E. Sunkist St., Ontario, Calif.

Gentlemen: Please send data on use of Exchange Low Methoxyl Pectin in ( ) low-calorie jams ( ) aspics ( ) fruit jells ( ) relishes ( ) desserts ( ) sauces ( ) other.

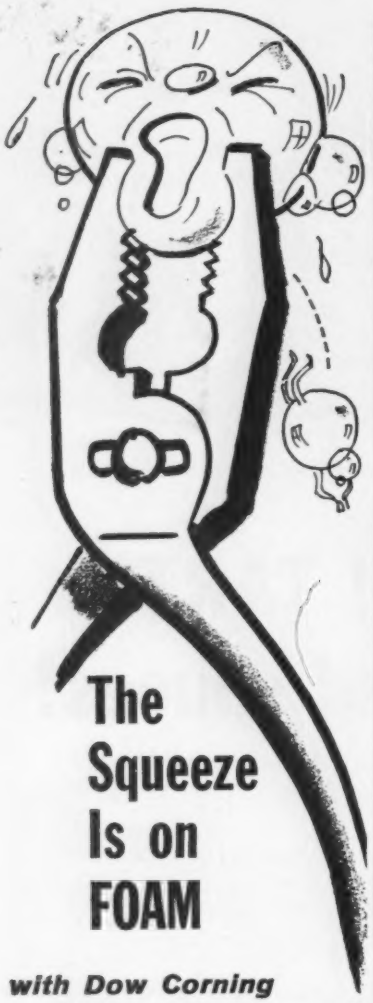
NAME _____

ADDRESS _____

CITY _____ ZONE ____

STATE _____

Exchange



The Squeeze Is on FOAM

with Dow Corning Silicone Defoamers*

There's a *right* tool for every job. In foam control it's Dow Corning silicone antifoamers or defoamers . . . job-proved thousands of times over as the most efficient, most economical, and most versatile foam suppressors available.

*At prescribed levels, are sanctioned by FDA

FREE SAMPLE
and new manual on foam control

first in silicones

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MIDLAND, MICHIGAN
Dept. 3717a

Please rush a FREE SAMPLE of a Dow Corning silicone defoamer for my product or process, which is (indicate if food, aqueous, oil or other): _____

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

Equipment & Supplies

Called Multi-Bearing, they allow horizontal bearing adjustments from 6-24 in. and mount 143 different bearing shaft sizes from 5/8-2-7/16 in. dia. Mounting pads are easily adjusted to holes in the block. One pad is moved by an adjusting screw, the other slides freely to the proper distance between holes. This permits each size of takeup frame to accept a wide range of pillow-block bore sizes.

Frames have strong channels that protect the adjusting screw and provide easy access for lubrication and cleaning. The large-diameter adjusting screw is zinc plated for protection against rust. Mounting feet, formed from heavy-gage steel, have two stiffening ribs for added strength and mounting pads are of one-piece steel welded construction. — *Link-Belt Co, Chicago.*

Circle 412 on Inquiry Card

3-Zone Pasteurizer-Cooler heat-processes glass, metal, or plastic containers in first zone; applies fine mist for evaporative cooling in second area, then air-dries in third zone. A full-width conveyor belt moves all containers at the same speed. — Standard Metal Products Co., Chicago.

Circle 413 on Inquiry Car

Carton Imprinter applies control numbers, codes, prices, etc., on bodies or flaps of folding cartons. Available in styles that print either from above or below, units are specifically designed to attach to all popular automatic cartoners.—Adolph Gottscho, Inc., Hillside, N. J.

Circle 414 on Inquiry Card

Versatile Loader distributes free-flowing bulk material in any direction from a given point. Unit (Speed Loader) fills boxcars, trucks, storage building, etc., at rates up to 8,600 cu. ft. per hr.—Fort Worth Steel & Machinery Co., Fort Worth, Tex.

Circle 415 on Inquiry Card

Fish-Stick Packaging Unit combines a specially modified machine (BK Morpac) with a new waxed, glue-sealed carton. It automatically loads frozen products onto a

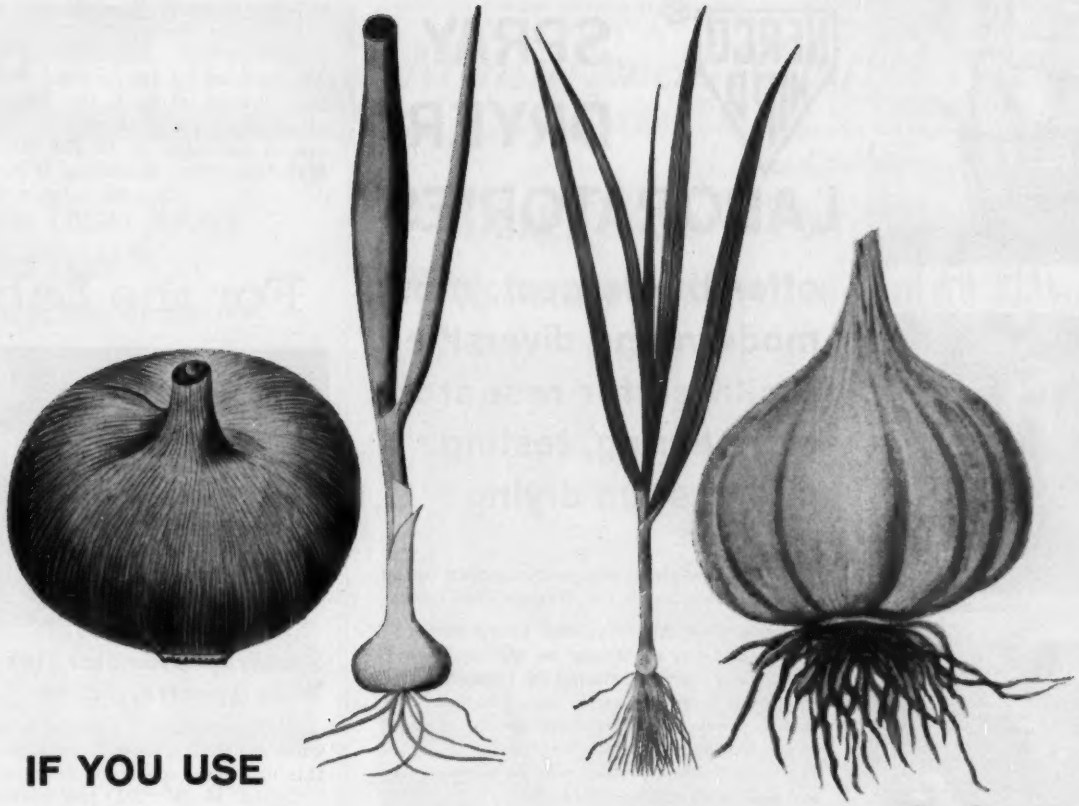
(Continued on page 148)

keeps food frozen from warehouse to outlet— without refrigeration

New AVCOLD container can be moved to frozen storage, filled, put in truck, taken to retailer **with one food-handling!** • Keeps 1500 lbs. or 39 cu. ft. frozen for hours. Helps meet standards of Assn. of Food & Drug Officials • Handles with forklift or handjack • 40" x 40" x 65" • Steel, aluminum, foamed-in-place polyurethane insulation • Lightweight.

For more information, write: Avcold, Nashville Division, Avco Corp., Nashville, Tennessee.

Avco / Nashville



IF YOU USE

Onion AND *Garlic*

TRY D&O's DOLCOSEAL ONION & DOLCOSEAL GARLIC

These Advantages —— Fresh Oil Flavor Instant Solubility Non-Hygroscopic

DOLCOSEAL ONION AND GARLIC are spray dried products made from pure, natural oil, of a quality available only from D&O. Equal in flavor strength to dehydrated onion and garlic, their stability and storage life far exceed that of the former. They are instantly soluble in water, and non-hygroscopic (will not cake in storage or ball up in a slurry). The flavor and aroma are that of natural onion and garlic and are instantly available, requiring no time for leaching out. In most applications, starting recommendations call for use of one pound of **DOLCOSEAL ONION** or **GARLIC** to replace one pound of dehydrated material.

Send your request for copy of the DOLCOSEAL ONION & GARLIC brochure to the D&O Dry Materials Division, 249 Goffle Road, Hawthorne, N.J.

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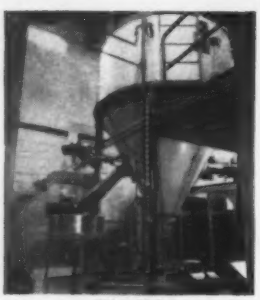
D&O ESTABLISHED 1798

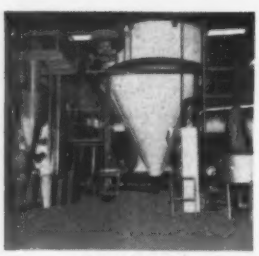
FLAVOR BASES
ESSENTIAL OILS
AROMATIC CHEMICALS
DRY FLAVORINGS
AND SEASONINGS

Portable Unit

Utility Unit



Pilot Unit



Industrial Unit

NERCO NIRO®

SPRAY DRYER LABORATORIES

offer the largest, most modern and diversified facilities for research, engineering, testing and custom drying

Nerco-Niro maintains the most complete spray dryer laboratories in the Western Hemisphere.

The diversified dryer facilities permit research, testing and custom drying on the best suited scale. Tests may be started in laboratory-size equipment and progress in stages to full scale volume production or, research may be confined to any intermediate step. Analysis of raw material and finished product may be evaluated in our well-equipped analytical lab.

The four dryers pictured at the left are equipped with all stainless steel contact surfaces. Throughout the laboratories, process steam is furnished for the jacketed tanks and pipes. Modern receiving and storage facilities are available for all types of shipment.

You are cordially invited to visit and inspect our facilities. Arrangements must be scheduled in advance so as not to conflict with confidential spray drying tests being conducted for our clients.

Nerco-Niro Spray Dryer Div.

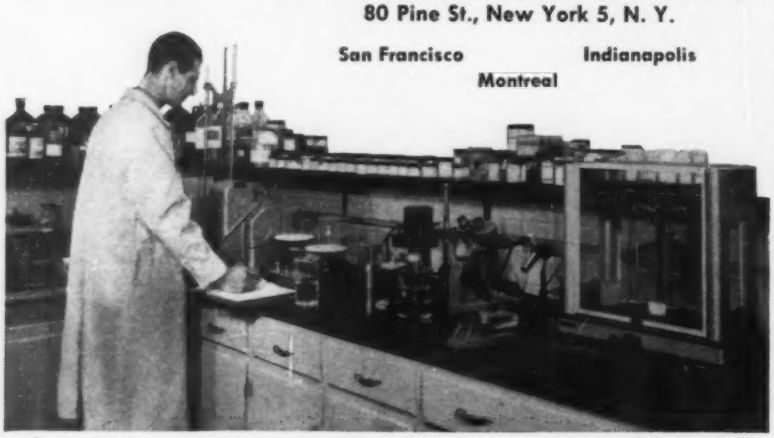
NICHOLS

Nichols Engineering & Research Corp.

80 Pine St., New York 5, N. Y.

San Francisco Indianapolis

Montreal

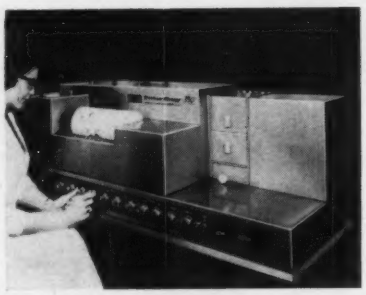


Equipment & Supplies

flat, printed carton blank; wraps the carton around the sticks; glues three sides, then discharges sealed packages at 40 per min.—Marathon Div., Menasha, Wis.

Circle 416 on Inquiry Card

For the Lab



Spectrophotometer Has Wide Spectral Range

High precision in an unusually wide spectral range is offered by this universal spectrophotometer.

Called Model 350, the ratio-recording unit ranges 175 millimicrons in the ultraviolet to 2.7 microns in the near-infrared. Entire optical path can be purged to optimize performance in the far ultraviolet, and near-infrared performance can be extended to 3.6 microns.

In addition, instrument offers low stray light characteristic, ordinate scale expansion, zero absorbance line (I_o) compensation system, and rapid pen response.—*Perkin-Elmer Corp., Norwalk, Conn.*

Circle 417 on Inquiry Card

Automatic Sampler aspirates aliquot of sample, combines it with measured volume of reagent, and discharges the mixture into a tube ready for analysis. Machine (Filamatic) saves time, eliminates pipette washing and breakage.—National Instrument Co., Baltimore.

Circle 418 on Inquiry Card

Precision Electronic Balance supplements the conventional analytical balance at the low end of its range, Accurate to 0.001 mg., unit (Electrobalance) has 11 ranges from 0-1 mg. to 0-1 gm. that are selected by panel switch.—Cahn Instrument Co., Paramount, Calif.

Circle 419 on Inquiry Card

neptune

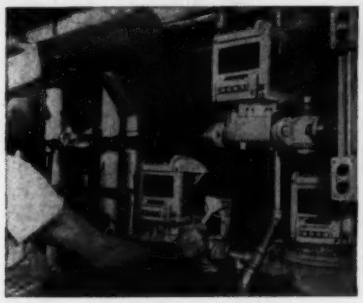
An advertisement written to help you

Measurement/Control News

prepared by Neptune Meter Company

Three Liquid Meters Boost Table Syrup Production by 200%

The use of automatic shut-off meters at Nalley Syrup Co. now allows one man to produce three times the syrup formerly produced by five men handling bulk sugar and barreled corn syrup. The meters are



preset by pushbutton, taking less than 30 man-seconds to measure the sugar, syrup and water.

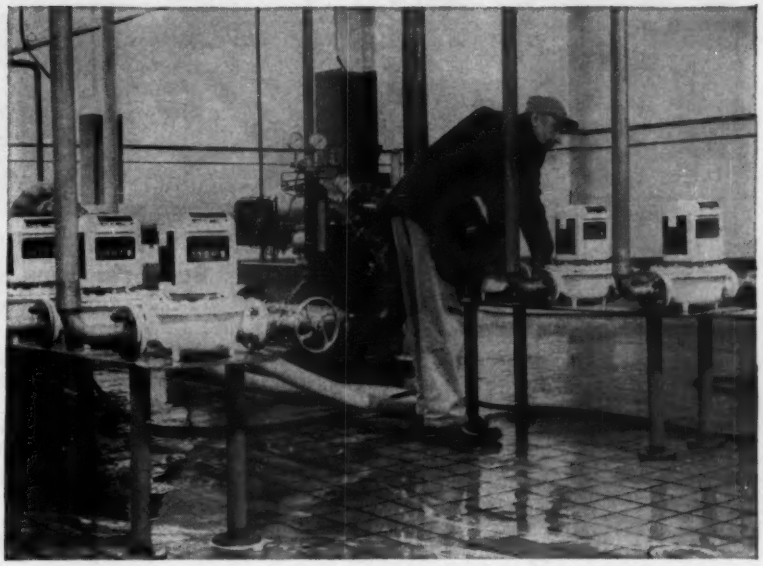
What works with these food ingredients can also work for you. Write today for helpful Bulletin 566R , with selector charts listing over 150 different liquids now being metered.

Meter with a memory... Never forgets your formula

For liquid batching where formula repeats, this automatic meter has precise mechanical memory. Set quantity just once, open valve, and meter takes over. Shuts off at correct quantity batch after batch. Can even print tickets. Easy to reset for new formula. Ask for facts on Repeating Auto-Stop.

HOW TO STOP DRIP OF VISCOUS LIQUIDS. When metering viscous liquids, don't try to drain the line between meter and vat after each delivery. It'll drip forever, and you usually don't want air contact anyway. Instead, put an inexpensive spring-loaded Anti-Drip valve on the end of the pipe. Ask Neptune.

Carling's Improves Beer-makers' Art With Accurate Meters to Control Flavor



NATICK, MASS.—To make sure every drop of Carling's beer is formula-perfect, more than a dozen liquid meters accurately measure and record liquids used in various stages of the process at Carling's big Natick brewery. Principal uses are in finishing and blending, in filtration and carbonation rooms, and in wort processing.

Flow of many different liquids is registered automatically and continuously by Neptune meters, with big time-savings over batch-measuring methods previously used. According to Roger D. Williams, plant engineer, the meters are accurate and trustworthy, and are valuable for inventory control in addition to quality and uniformity control.

Look around your plant for similar savings. Ask us for Meter Specification Guide No. 566B. It will help you state your requirements to Neptune specialists. They will be glad to recommend the size and type of meter best suited to your requirements.

HELPFUL METERING DATA AVAILABLE

28-pg. technical bulletin lists liquids, helps pick proper sizes and features of meters 2 to 2000 gpm.

NEPTUNE METER COMPANY · Liquid Meter Division
47-25 34th St., Long Island City 1, N.Y.

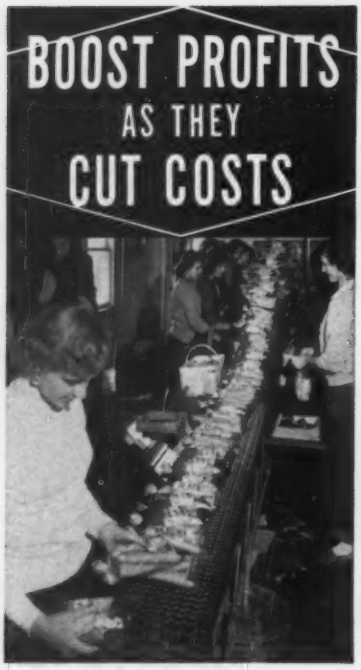
☐ *Please send me helpful Meter Bulletin 566R*

☐ *Send Meter Specification Guide 566B*

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____ CITY & STATE_____



LA PORTE

FLEXIBLE STEEL CONVEYOR BELTS

When used in freezing, canning, or dehydrating . . . on sorting tables, in scalders, washers or cookers . . . for bulk or packaged goods . . . LaPorte Flexible Steel Conveyor Belts give low-cost, worry-free service. The non-corrosive metal is not effected by steam, water or extreme temperatures. Their strong, flexible construction resists stretching and assures a positive drive on the LaPorte Sprocket. They are easily and quickly cleaned and sterilized with steam or scalding water, and no special dressings or belt lacers are needed to keep them in peak condition.

If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

LA PORTE MAT & MFG. CO.
Box 124
La Porte, Indiana

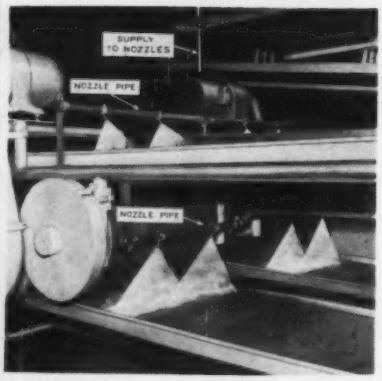
Please send free literature on your Conveyor Belt.

NAME_____

ADDRESS_____

CITY_____ STATE_____

Plant Sanitation & Maintenance



Jets Clean Conveyor Belt Cut Costs, Bacteria Counts

Cleaning time for conveyor belts may be cut as much as 65% with this automatic jet system. Moreover, residual-bacteria counts are said to be sharply reduced.

Thus, a 200-ft. belt operating at 20 fpm. can be cleaned in 10 min. In one plant, such cleaning has cut microorganism counts from 250,000 to 30,000.

Operated on plant steam and cold water, system has two basic components:

1. Multiple high-pressure nozzles, spaced above and below the belt, force jets of hot water and detergent against belt surfaces at 125-150 psi. The flat jets, which spread to about 35 deg., provide cutting action that strips refuse from belt.

2. Supplying the nozzles is a 4,000-gph. hydraulic jet unit of venturi-injector design. It combines plant steam, cold water, and detergent to deliver 180-F. liquid.

Simple adjustment of control valves initiates cleaning and rinse cycles. Thus, cleaning can be done with minimum interruption to production. System is not limited to flat rubber belts, but may also be used in cleaning of steel-mesh belts, metal elevators, etc.

Furthermore, the same equipment can be used for in-plant chlorination merely by by-passing the jet unit and using cold water at the nozzles.—*Sellers Injector Corp., Philadelphia.*

Circle 451 on Inquiry Card

Magnetic Floor Sweeper

Nails, tacks, and light ferrous scrap may be easily and quickly swept up from floors with this magnetic unit.

Known as Sweeperette, it is powered by a permanent magnet tube mounted on Neoprene wheels. A 5-ft. offset handle permits operator to push the sweeper under objects without stooping. Unloading is quickly accomplished by removing the tube and clearing it with an attached Neoprene wiper ring. A lightweight, detachable collection pan at base of handle speeds unloading.—*Eriez Mfg. Co., Erie, Pa.*

Circle 452 on Inquiry Card

New Floor-Repair System

Superior adhesion and protection from acid and alkali corrosion are advantages reported for a recently patented polyamid cured epoxy compound.

Employed for repairing and refinishing concrete surfaces, product (Floor-Nu) offers a tough, resilient overcoating that doesn't crack or chip under impact. Moreover, it is non-shrinking and may be applied to damp as well as dry surfaces.—*Steelcote Mfg. Co., St. Louis.*

Circle 453 on Inquiry Card

Odorless Steam-Cleaning Compound has built-in water conditioners that inhibit scale formation in coils or tanks. Non-caustic product (45A), which can be used on sensitive alloys, offers superior detergent action.—Delta Chemical Corp., Memphis, Tenn.

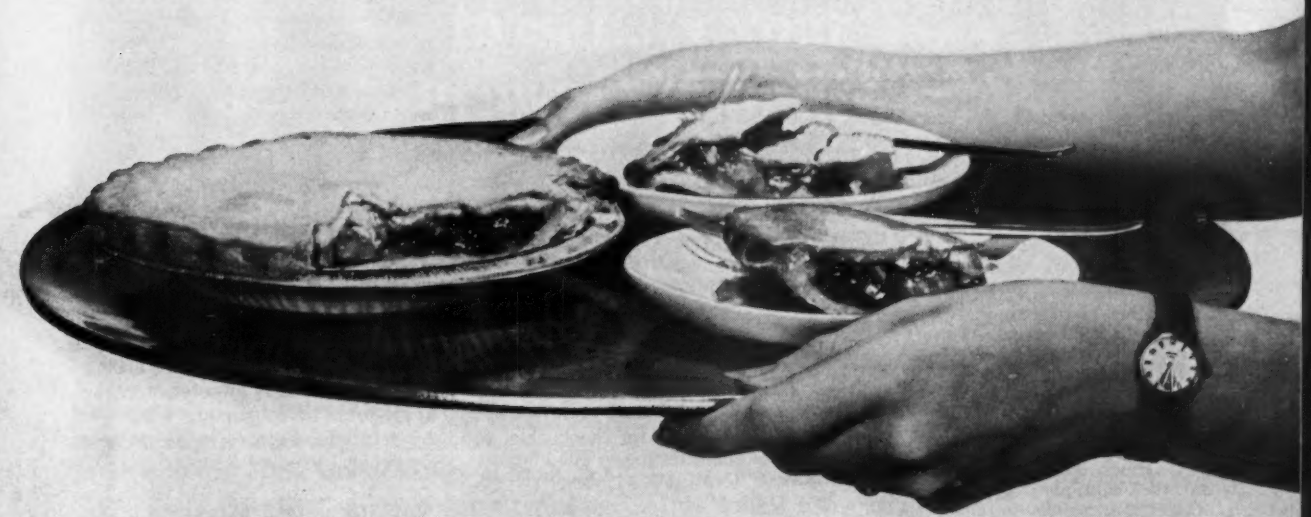
Circle 454 on Inquiry Card

a little cmc makes a big difference

Processors of frozen fruit pies find that a little Hercules Cellulose Gum, purified CMC, in the fillings makes a big difference. Hercules Cellulose Gum is used in these items, such as this cherry pie, because it makes it easier to control viscosity and gives the pies freeze-thaw stability. At the same time, cellulose gum combined with the starch thickens juices to the proper consistency for handling and eating; prevents floating or settling of the fruit; and contributes to more desirable gel texture. The filling will be clearer and brighter and show the fruit to best advantage.

For better frozen pies and constant formulations next time try a little cellulose gum. It makes a big difference.

For details write to Hercules.



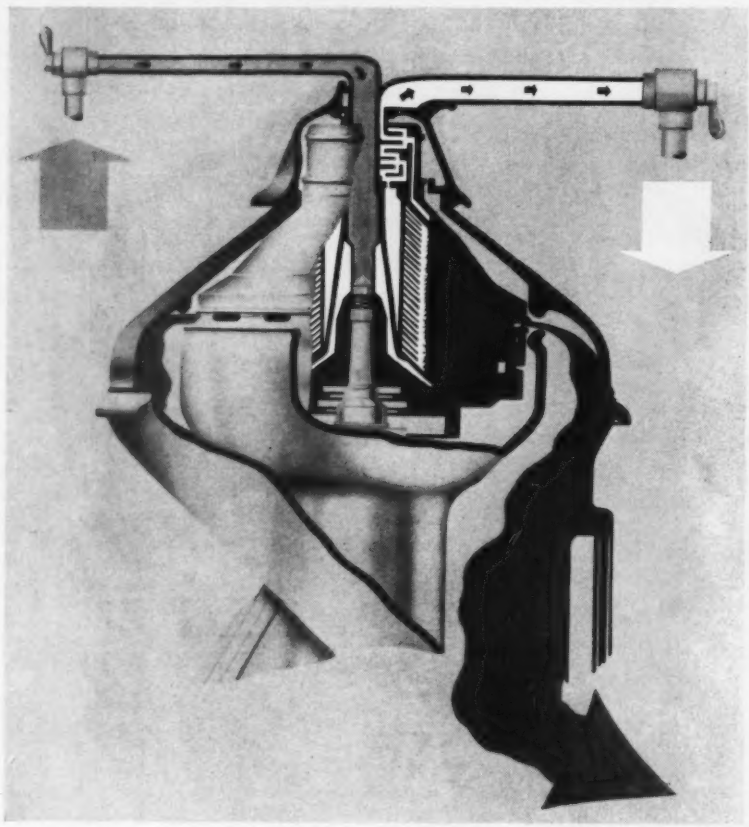
Hercules® Cellulose Gum

VC61-2

HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware

CIRCLE 151 ON INQUIRY CARD

FLUIDICS* AT WORK



Why sludge won't clog this self-cleaning centrifuge

There are no nozzles in the Pfaudler® Titan Centrifuge. Instead, you have *slots*.

Slots that can handle dry, compact sludge with particle sizes up to ⅛ inch in diameter. Slots that won't clog. Slots that keep downtime to a minimum.

SELF-CLEANING. Moreover, with this centrifuge, your labor costs are reduced because the Titan cleans itself while operating at full speed. Adjusting hydraulic controls accommodates varying solids content of the feed and desired sludge dryness.

HIGH CAPACITY. The Titan offers a separating power as high as 7500 times gravity, much more than you can get with other continuous centrifuges.

Throughput capacity ranges up to 6000 gallons per hour.

TACKLES TOUGH ONES. The Pfaudler Titan Superjector can handle even your most difficult separations:

- two liquids and a solid simultaneously
- solids that are only slightly heavier than liquids
- liquids that are highly viscous or aerated
- fine, slimy or abrasive particles

FREE BULLETIN. Our Bulletin 1002 spells out in detail all of the design features, gives specs for the seven different models, and outlines applications for the Titan Superjector.

TEST PROGRAM. Your products can be tested either in the Pfaudler Test Center or in your plant with a portable production unit.

Address requests for the booklet or questions about testing to our Pfaudler Division, Dept. FE-51, Rochester 3, New York.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS...the science of fluid processes

Useful New Books

European Markets

AMERICAN ENTERPRISE IN THE EUROPEAN COMMON MARKET: A LEGAL PROFILE. *Ed. by Eric Stein and Thomas L. Nicholson. Michigan Legal Publications, Univ. of Michigan Law School, Ann Arbor, Mich. 1960. 2 Vol. Price: $25.00.*

Here is a new publication designed primarily for companies considering entry in the European Market. The result of a cooperative effort by 11 scholars and practitioners on both sides of the Atlantic, this profile points out trends of interest to American businessmen and their counsellors.

Volumes include chapters on: The Establishment of the Customs Union; Exchange Control Regulations in France; Industrial Property; Labor Law and Social Security; New Legal Remedies of Enterprises; Organizing for Business; The Significance of Treaties to the Establishment of Companies; Protection of Competition; Taxation; and The Association with Overseas Countries and Territories.

With background information provided here, you should be better able to select and use the services of European experts on whom you must depend for definitive counsel.

Booklets & Reports

MARKETING ARTIFICIALLY SWEETENED GRAPEFRUIT JUICE. *U. S. Dept. of Agriculture, Market Development Research Div., Agricultural Marketing Service, Washington, D. C. 1960. 43p.* Evaluates acceptance of artificially sweetened grapefruit juice by consumers when sold by retail food stores in 46 oz. cans as general grocery items.

THE HOUSEHOLD MARKET FOR SELECTED CANNED FRUITS AND VEGETABLES. *(Report No. 427). U.S. Dept. of Agriculture, Agricultural Marketing Service, Market Development Research Div., Washington 25, D.C. 1960. 33p.* Reports seasonal changes in consumer purchases on national and regional basis.

Little wonder that today's food processors have a voracious appetite for MSG: Its effectiveness as a flavor enhancer of the widest variety of foods and its improved economies of use create an ever-increasing demand. Merck meets the demand with a 100% increase in MSG production capacity. This $2 million plant expansion puts Merck in the best possible position to supply your MSG needs.

Merck produces MSG by a new and technically advanced fermentation process that utilizes raw materials available in unlimited supply—and that assures unsurpassed quality. Make Merck your basic source for MSG and also enjoy the benefits of a research and technical service program that has solved many of the food industry's toughest problems. Call your Merck Representative or contact Rahway directly for full details on delivery, price and quality of Merck MSG.

MERCK CHEMICAL DIVISION
MERCK & CO., INC. • RAHWAY, NEW JERSEY

CIRCLE 153 ON INQUIRY CARD

Recent Inventions

PROCESSING

Forming Closed Package Containing Heat-Affected Foods Disposed in Space Relation From Upper and Lower Strips of Heat-Sealable Material.—H. A. Mead, Butter-Pak, Inc., Denver. No. 2,958,173.

Inhibiting Microbiological Growth in Yeast-Employed Fermentation. — F. B. Strandskov, The F. M. Schaefer Brewing Co., Brooklyn. No. 2,964,406.

Continuously Tempering Flowable Liquid-Retaining Cereal Grains to Pre-determined Moisture Content.—W. C. Gates, Flossmoor, Ill. No. 2,964,408.

Producing Aqueous-Based Liquid Foods Characterized by Presence of Oxidation-Retarding 2,4,5-Trihydroxybutyrophenone. — G. H. Kinsman, Basic Products Corp., Milwaukee. No. 2,964,410.

Preserving Meats by Subjecting to Synergistic Action of O.-Free Product of Combustion and by Irradiating.—B. E. Williams, Hodges Research & Development Co., N.Y.C. No. 2,965,494.

Precipitating Antimycotics Electrostatically on Cheese. —H. G. Foster, Jr., Swift & Co., Chicago. No. 2,965,495.

Forming a Flour and Fig Material Into Strips Cut Into Predetermined Pellet Lengths. — R. J. Connelly, S. M. Wolff Co., N.Y.C. No. 2,965,502.

Stabilizing Fats and Oils by Adding Alpha Sitosterols.—S. S. Chang, Swift & Co., Chicago. No. 2,966,413.

Producing a Dietetic Cured Food Product.—M. W. Kossoy, Swift & Co., Chicago. No. 2,966,416.

Want more information on any of these recent patents—if so you may obtain detailed printed copies by writing direct to The Commissioner of Patents, Washington 25, D. C., giving serial number of those you want and enclosing 25¢ for each copy.

Preparing Miso by Adding Yeast and Mold Rice to Cooked Soybean Grits and Then Fermenting and Aging.—A. K. Smith, USDA. No. 2,967,108.

Dehydrating Fruit and Vegetable Juice Concentrates Formed Into Stable Foam. —A. I. Morgan, Jr., USDA. No. 2,967,109.

Manufacturing Dry Starch Product That Partially Swells When Mixed With Cold Water. — P. J. A. Beersma, Naamloze Vennootschap W. A. Scholten's Chemische Fabrieken, Groningen, Nether. No. 2,967,110.

PACKAGING

Housed Unit With Rotor-Driven Vanes and Eccentric for Introducing Foods Into Containers. — P. Gaudlitz, Heinz Becker, Hamburg-Blankenese, Ger. No. 2,963,735.

Machine for Packaging Liquid Products Inside Covers of Plastic Materials. — L. Doyen, Lyon, France. No. 2,963,840.

Apparatus for Layer Pack-Olives Into Containers.—M. Calvache, N. Caldwell, N. J. No. 2,964,893.

Paperboard Holder for Carrier-Packing Cans. — R. G. Hughes, Continental Can Co., N.Y.C. No. 2,965,410.

Sliced Bacon Package Comprising Two Rigid Paperboard Sheets With Envelope - Forming Transparent Flexible Wrapper Within Each Sheet.—P. F. Durham, Packers Packaging Co., Inc., Muncie, Ind. No. 2,965,497.

Packaging Products Ranging in Consistency From Batter to Dough Into Container in Which They Are Pressure Heated to Sterilize.—W. J. Sanger, Long Beach, Calif. No. 2,965,500.

Frozen Pie Package Out of Aluminum Foil Pan for Filling Separated From Dough by Foil Plate.—L. J. Harriss, Chicago. No. 2,965,501.

Filling and Closing Unit for Evacuating and Gas-Treating Filled Bags.—A. Grafingholt, Firma Fr. Hesser, Mashinenfabrik - Aktiengesellschaft, Stuttgart - Bad Cannstatt, Ger. No. 2,966,019.

Machine for Forming, Filling, Sealing and Severing Containers. — G. W. Lane, Liqua-Pak, Inc., Omaha. No. 2,966,021.

EQUIPMENT

Citrus Fruit Peeler for Cutting Peel Into Segments That Are Stripped Off Fruit.—R. Polk, Jr., Food Machinery & Chemical Corp., San Jose, Calif. No. 2,958,356.

Material Handling Control System for Filling Hopper With Predetermined Quantity of Preselected Material From Preselected Storage Bin and for Discharging Material From Hopper to Conveyor. — D. W. Fath, Cutler - Hammer, Inc., Milwaukee. No. 2,962,172.

Product Turn-Over and Transfer System for Continuous Griddles. — E. M. Noel, Newton Highlands, Mass. No. 2,962,984.

Device for Cutting Meat Into Small Chunks for Subsequent Comminuting.—A. W. Hughes, Bensenville, Ill. No. 2,963,062.

Magnetic Belt Drive for Unit Measuring and Feeding Salt Into Containers.—W. M. Buell, Diamond Crystal Salt Co., St. Clair, Mich. No. 2,964,071.

Grading and Separating Device for Peeled and Shell-on Shrimp Comprising Inclined Pan and Plurality of Grading Screws. — LeRoy E. Demarest, The Peelers Co., Houma, La. No. 2,964,181.

Depositor With Delivery Rolls For Forming Thin Wafer - Like Candies Onto Conveyor.—F. F. Lambiase, Hasbrouck Heights, N. J. No. 2,965,048.

Stabilized Tray Conveyor for Oven.—W. H. Royer, Capital Products Corp., Mechanicsburg, Pa. No. 2,965,049.

Radiation Device for Measuring and Controlling Weight of Ribbon - Formed Dough.—G. I. Doering, Industrial Nucleonics Corp., Columbus, O. No. 2,965,050.

Solenoid - Actuated Electrical Animal Stunning Device. —W. P. Judge, Detroit, Mich. No. 2,965,919.

Egg Breaking Machine.—C. H. Willsey, Topeka, Kans. No. 2,966,184.

Fruit Stemmer Comprising Elongated Roll Bed and Plurality of Pairs of Rotable Stem-Picking Rolls.—F. Leinweber, Mainz-Mombach (Rhine), Ger. No. 2,966,185.

Hydraulic Multicontact Sliced Bacon Slice Controller.—O. Garapolo, Wilson & Co., Chicago. No. 2,966,186.

Strawberry Grader With Spaced Parallel Diametrically Opposed Pairs of Vertically Disposed Legs. — D. C. Holmes, Somerset, Ky. No. 2,966,263.

PRODUCTS

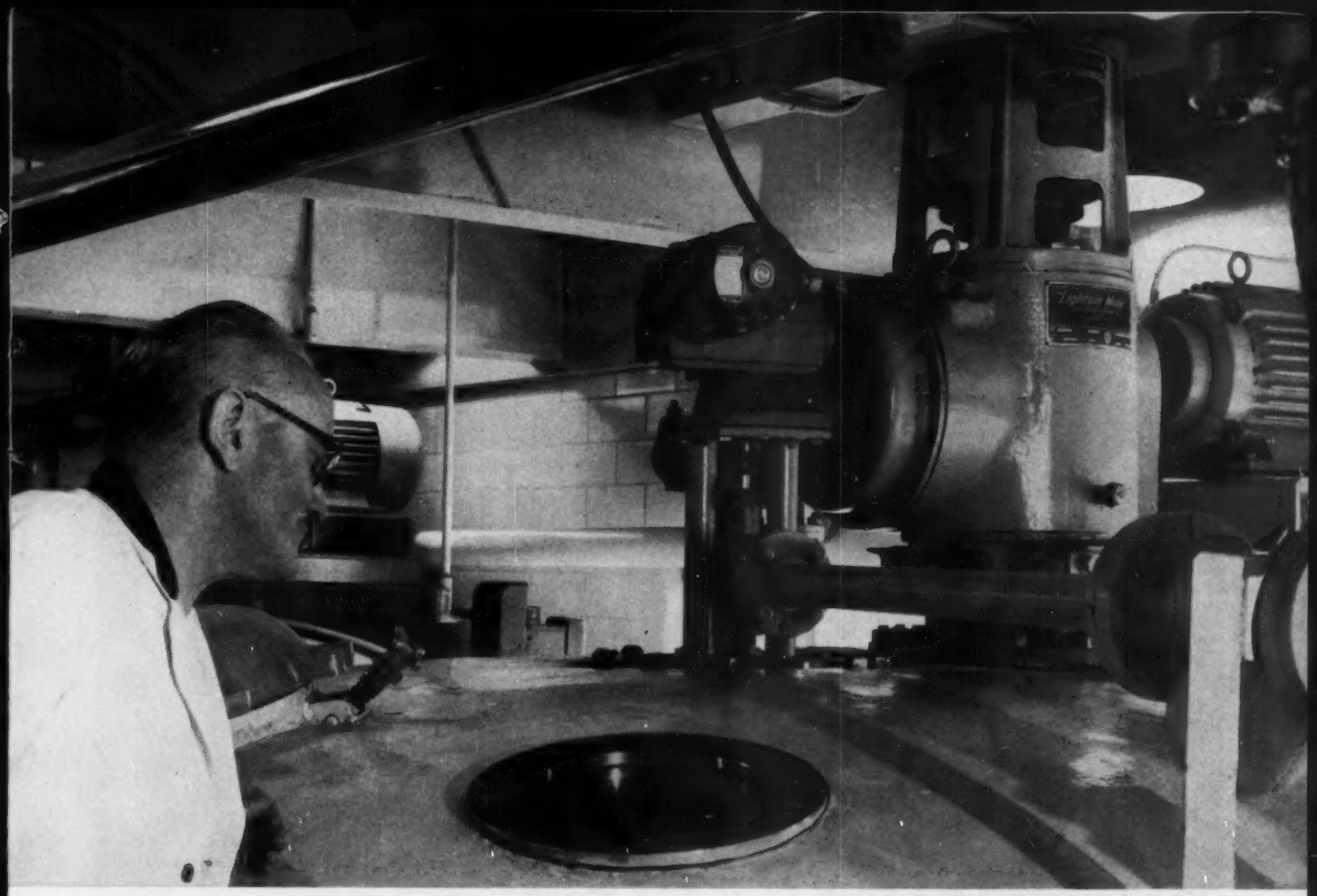
Improved Shortening for Use in Icings.—S. S. Chang, Swift & Co., Chicago. No. 2,966,410.

Shortening with Wide Plastic Range and Good Creaming and Cake-Baking Characteristics. — T. J. Weiss, Swift & Co., Chicago. No. 2,966,411.

Itaconic Acid-Modified Triglyceride Shortening.—J. L. Gleason, The Rath Packing Co., Waterloo, Ia. No. 2,966,412.

Fondantized Chocolate Flavoring for Ice Cream.—L. R. Cook, Ambrosia Chocolate Co., Milwaukee. No. 2,969,286.

Quick-Cooking Rice Produced by Subjecting Uncooked Grains to Starch-Gelatizing Moisture - Heat Treatment. — C. E. Flynn, General Foods Corp., White Plains, N. Y. No. 2,969,288.



Hiram Walker & Sons Limited, Walkerville, Ontario

Canadian Club begins with good mixing

This big yeast tank is Step One in a process that develops and protects the unique qualities of Canadian Club whisky.

In six tanks like this one, the yeast incubates 24 hours in a medium of sterilized malt, rye, and water under conditions of surgical cleanliness and strictly monitored temperature.

A turbine-type LIGHTNIN Mixer keeps the culture medium in constant, even flow to insure uniform temperature throughout each of the big jacketed tanks.

Slurrying, cooking

While yeast propagates, another LIGHTNIN Mixer rapidly slurries barley malt in water, suspending the fine grains in a homogeneous, lump-free mixture that permits close control of available enzyme content.

Concurrently, 12 more LIGHTNIN Mixers mounted on four cereal cookers keep heat uniform as live steam cooks grain starch to a mash. Mixing continues at constant speed despite an extreme jump in viscosity as the hot mash is flash-cooled.

Reacting, fermenting

Next, cooled mash and malt slurry meet in converter tanks where LIGHTNIN Mixers assist the starch-enzyme reaction by holding ingredients in a uniform dispersion.

Finally, maltose-rich mash is mixed with the 24-hour-old yeast in conical-bottom fermenter vessels. After fermentation the fermented mash is pumped to beer wells where bottom-mounted propeller-type LIGHTNIN Mixers keep the insoluble grain particles in complete and uniform suspension. From beer wells the mash is fed continuously to distilling columns.

What user says

"LIGHTNIN Mixers are selected throughout our plant," declares Frank D. Leeder, superintendent of manufacturing and maturing at this Hiram Walker distillery, "because they meet our requirements for trouble-free service, performance, and sanitary maintenance—and, of equal importance, the service we receive when we have a problem. MIXCO makes their machines work. Our experience with LIGHTNIN Mixers has firmed our belief that no one knows more about mixing than the people at MIXCO."

For fluid mixing that does what you want it to do—at lowest long-term cost—call in your LIGHTNIN Mixer representative. His name is in Thomas' Register and in the yellow pages of your telephone book. Or write directly to us.

"Lightnin® Mixers"

MIXCO fluid mixing specialists

MIXING EQUIPMENT Co., Inc., 143-e Mt. Read Blvd., Rochester 3, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.

In Europe: Lightnin Mixers, Ltd., Poynton, Cheshire, England

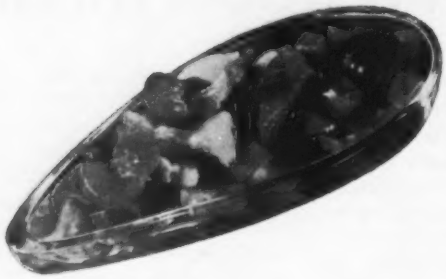
CIRCLE 155 ON INQUIRY CARD

BE SURE IT'S THE RIGHT FLAVOR FOR YOUR PRODUCT

ICE CREAMS – SHERBETS

In this category, our catalog features the old favorites—vanilla, chocolate, strawberry—along with a large and provocative assortment of other intriguing flavors.

There are flavors . . . *and there are* FLAVORS! One that produces a superb effect in another manufacturer's product is not necessarily the flavor best suited for yours. As a supplier of flavors seriously concerned with the final results of our products' use, it has been our aim to provide our customers with a wide range of flavors in groups precisely conditioned to their various and specific needs. To accomplish this, our flavor specialists have worked closely for years with food plant superintendents and technologists in the perfection and refinement of our products. As a result, our present catalog lists, in easy-to-use tabulations, definite flavor recommendations for practically every type of food and beverage product made. If you'd like a copy, we'll gladly send you one upon request.



PICKLES – RELISHES

A useful guide to pickle processors—listing high purity oleoresins and a fine selection of tried and proven spicing compounds, each with subtle emphasis upon a different spice.

CUSTARDS – PIE FILLERS

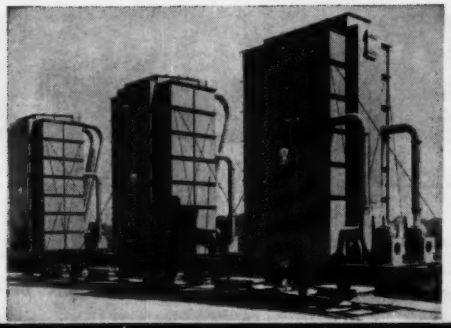
Here recommended—some very interesting specialties; also, popular group selections which provide a range of price and effect designed to meet any manufacturer's particular needs.

FRITZSCHE BROTHERS, Inc.

A FIRST NAME IN FLAVORS SINCE 1871

76 NINTH AVENUE NEW YORK 11, N. Y.

Branch Offices and *Stocks: Atlanta, Ga., Boston, Mass., *Chicago, Ill., Cincinnati, Ohio, Greensboro, N. C., *Los Angeles, Cal., Philadelphia, Pa., San Francisco, Cal., St. Louis, Mo., Montreal and *Toronto, Canada; *Mexico, D. F. and *Buenos Aires, Argentina. Plants: Clifton, N. J. and Buenos Aires, Argentina.

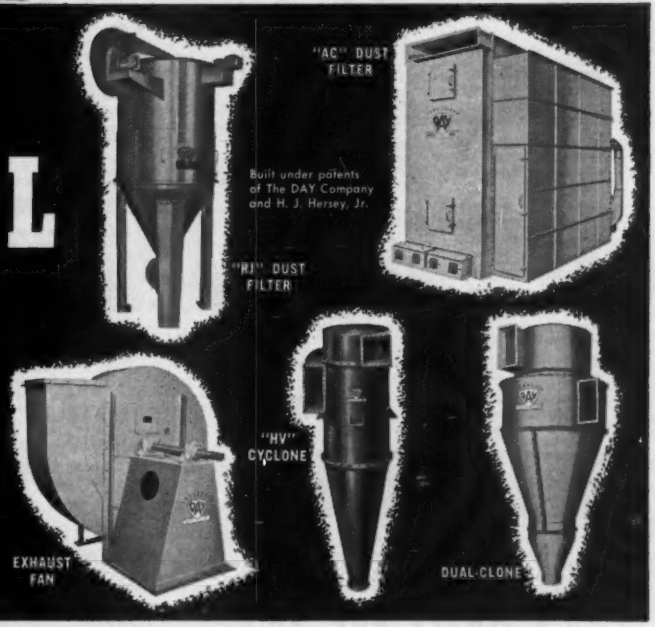


A battery of DAY "AC" dust filters located on the roof of a food plant processing starch. In addition, several "AC" filters are used within this plant. DAY equipment is also solving dust problems for many other dry foodstuffs manufacturers. Cake mixes, baking powder, cocoa, sugar, cereals, flour, powdered sugar, coffee, dried eggs and grain are some of the many other types of food products handled by DAY equipment. If your plant manufactures foodstuffs involving pulverized ingredients or dry products, be sure and check DAY for efficient, economical dust control.

DUST CONTROL

THE WAY YOU LIKE IT!

- *Efficient*
- *Trouble-free*
- *Economical*



No two dust problems are identical . . . that's why it will pay you to consider DAY *engineered dust* control. Laboratory research, 80 years of practical experience and a *guaranteed approach* to efficient dust control are some of the reasons why companies of every size decide on DAY dust control. DAY offers a *complete* line of dust control equipment . . . seven types of collectors or filters — 166 different models . . . one is sure to solve your dust problem exactly, efficiently and economically.

Complete DAY service includes:

1. A field survey of the problem
2. A recommended solution
3. An engineered layout of equipment and/or system
4. Fabrication of equipment, piping, suction hoods, etc.
5. Installation
6. A GUARANTEE OF RESULTS

Whether you need equipment only or a complete system — contact DAY

FREE! HELPFUL, DETAILED INFORMATION ABOUT DAY Dust Control. Check and mail coupon toDAY. You'll receive free folders about DAY dust control equipment.

DAY SINCE 1881

equipment only or a complete system

----------CLIP AND MAIL COUPON TODAY----------

The DAY Company

817 Third Ave. N.E., Minneapolis 13, Minn.

In CANADA
The DAY Company of Canada, Ltd.
15 Brydon Dr., Rexdale (Toronto) Ontario

Please send information on:

☐ "RJ" Dust Filter ☐ "AC" Dust Filter ☐ Exhausters ☐ "HV" Cyclones ☐ Dual-Clone

NAME_____

COMPANY NAME_____

ADDRESS_____

CITY_____ STATE_____

CLASSIFIED ADVERTISING

EMPLOYMENT EQUIPMENT—USED or RESALE SERVICES

STAINLESS STEEL TANKS

(all Sanitary polished)

25—S.S. Tanks, in stock, from 500 gal. to 5000 gal. Vertical and horizontal. Some agitated. Atmospheric, pressure or vacuum type. Specify sizes you need.

SPECIALS

1—1500 gal. Glascote jacketed GLASS LINED REACTOR. 90 P.S.I. work press. in jacket. 50 P.S.I. work press. in shell. Vertical agitator and baffle. Six months service.

4—Buflovac DOUBLE EFFECT EVAPORATORS, (608-708-840-1025 sq. ft. each) with condensers, pumps, supports, etc. Stainless Steel Sanitary.

1—H.T.S.T. PASTEURIZER, Cherry-Burrell, 20,000#/hr. with plate exchanger, holding tube, controls, etc.

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Professional Services

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Analyses of Foods and Beverages
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PLANT DESIGN AND LAYOUT—PROCESSING EQUIPMENT—PRODUCT AND PACKAGE DEVELOPMENT AND IMPROVEMENT—WAREHOUSING — DISTRIBUTION — MARKETING
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1755 Broadway New York 19, N. Y.
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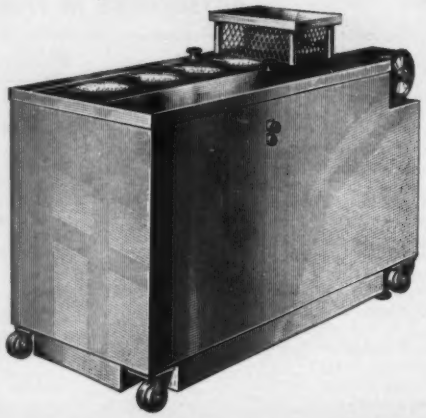
MODEL IV-M CLOSURE MACHINE

The ultimate in versatile production equipment for the medium volume food processor is made available with the Model IV-M. Basic mechanical motions and proved production experience have created a machine capable of handling a variety of products in aluminum foil containers with consistent quality closure.



EKCO-ALCOA PACKAGING EQUIPMENT combines speed, simplicity, dependability, versatility

High speed packaging equipment, custom engineered for medium or high volume users, is available from Ekco-Alcoa. It's another reason for choosing our aluminum foil containers. Ekco-Alcoa, leading foil container manufacturer, offers production packaging equipment to handle a variety of liquid or dense products. Consistent quality closures and the ability to handle a wide range of package sizes and shapes are among the outstanding features of Ekco-Alcoa's thoroughly tested and proved packaging equipment. Minimum space, maximum operator safety, easy accessibility for cleaning and maintenance, and variable packaging speeds are other reasons for connecting Ekco-Alcoa equipment to your line. For a complete brochure describing Ekco-Alcoa packaging equipment, write to our Packaging Equipment Division at the address shown below.

The Plus Container

EKCO-ALCOA CONTAINERS INC.
GENERAL OFFICES: WHEELING, ILLINOIS

EKCO is the registered trademark of Ekco Products Company; ALCOA is the registered trademark of Aluminum Company of America. The corporate name and combination mark, EKCO-ALCOA, is used under license to the manufacturer by each of these companies.

MODEL VI AUTOMATIC CAPPER & CLOSURE MACHINE

The Type VI Machine combines the experience gained over five years of actual production packaging of aluminum foil containers. It is the only mechanical equipment available for automatically capping and closing foil containers that has been thoroughly tested and proved prior to marketing.

FOOD ENGINEERING

READER INQUIRY SERVICE

FREE . . . to you! Cost-cutting, profit-making information.

Facts about equipment, ingredients, packages, supplies and services described or advertised in this issue are easily available to you through this section.

Numbers on back of each tear-out post card correspond to the key numbers on equipment, package, ingredient, sanitation, supply, or service items, and to advertisements.

It's easy. All you do is . . .

Select . . . items that interest you as you read this issue. All items are conveniently named in two lists on the following three pages. First list is alphabetically arranged by name of manufacturer or supplier. Second is alphabetical by product or service category.

Then . . .

Circle . . . number of each item you want on the back of one of the post cards.

Write . . . your name, title, company, and address in space provided on card.

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Use of inquiry cards restricted to those with buying authority or responsibility in food manufacturing.

CIRCLE KEY NUMBERS ON OTHER SIDE OF CARD. WRITE NAME, ADDRESS—AND MAIL!

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Advertisers' Alphabetical Listing

Circle corresponding numbers at left on Inquiry Card

4 **ABC Packaging Machine Corp.,** automatic case sealer.
112 **Air Reduction Sales Co.,** liquid nitrogen.
138 **American Baker Association,** baking ideas.
33 **American Steel & Wire,** conveyor belts.
78 **American Sterilizer,** microorganism producer.
110 **Anheuser-Busch, Inc.,** corn syrups.
16 **Autolite,** thermometers.
141 **Automatic Transportation Co., Yale & Towne,** electric truck.
174 **Avco Corp.,** freezing without refrigeration.
9 **Buffalo Meter,** meters.
94 **Centrico, Inc.,** Batch machine.
42 **Chemetron Corp.,** vacuum drying.
13 **Cherry-Burrell,** homogenizer.
36 **Chester-Jensen Co., Inc.,** tanks.
40 **Clinton Corn Processing Co.,** corn products.
101 **Corn Products Co.,** sugars, starches, syrups.
119 **Creamery Package Mfg. Co.,** milk tank.
157 **Day Co.,** dust control.
5 **DeMarkus Corp.,** CO_2 and nitrogen mfg. systems.
120 **Dicalite Dept., Great Lakes Carbon Corp.,** additive filtration.
140 **Distillation Products Industries,** monoglycerides.
147 **Dodge & Olcott,** onion and garlic flavors.
172 **Dole Refrigerating Co.,** freezing unit.
133 **Dorr-Oliver, Inc.,** centrifuges, filters.
60 **Dow Chemical Co.,** insulation board.
17 **Dow Corning Corp.,** silicones.
146 **Dow Corning Corp.,** silicone defoamers.
99 **Dow Corning Corp.,** silicone release agent.
162 **Ekco-Aicon Containers, Inc.,** packaging equipment.
81 **The Filter Paper Co.,** filter paper.
117 **Finvorex Co., Inc.,** rum flavor.
6 **Food Machinery & Chemical Co.,** filler.
62 **Food Machinery & Chemical Co.,** pouch packaging.
76 **Fostoria Corp.,** infrared oven.
59 **Foxboro Co.,** flow meter.
156 **Fritzsche Bros., Inc.,** flavors.
144 **Gas Atmospheres** gas packaging.
137 **General Electric,** stainless steel enclosures.
139 **B. F. Goodrich,** conveyor belts.
170 **Gottscho,** imprinter.
77 **Griffith Laboratories, Inc.,** proteins.
130 **Grinnell Co.,** valves, fittings.
151 **Hercules Powder,** cellulose gum.
14 **Hoffman-LaRoche Inc.,** beta carotene.
68 **Hoffman-LaRoche, Inc.,** beta carotene.
168 **International Flavors & Fragrances, Inc.,** flavors.
104 **Jamison Cold Storage Door Co.,** sliding doors.
126 **King Co.,** blast freezing.
115 **Klenzade Products, Inc.,** sanitation.
118 **Koch Supplies, Inc.,** mixers, grinders, blender.
142 **Kohlenberger Engrg. Corp.,** crushed ice maker.
125 **H. Kohnstamm & Co., Inc.,** flavors.
122 **Kraft Foods,** spray-dried sweet whey.
82 **Ladish Co., Tri-Clover Div.,** magnetic traps.
136 **Lakes States Yeast & Chem. Div., St. Regis Paper Co.,** yeast.
116 **F. H. Langsenkamp Co.,** tomato trimmer.
150 **LaPorte Mat & Mfg. Co.,** conveyor belts.
143 **Malayan Tin Bureau,** tin.
108 **Merck Chem. Div.,** ascorbic acid.
153 **Merck & Co.,** MSG.
134 **Miles Chem. Co.,** enzymes.
128 **Minneapolis-Honeywell,** thermo-couple.
155 **Mixing Equipment Co., Inc.,** mixers.
84 **National Starch & Chem. Corp.,** starch.
149 **Neptune Meter,** meters.
129 **Nestle Co., Inc.,** beef flavor.
148 **Nichols Engrg.,** spray dryers.
167 **Norda,** flavors.
135 **Oakite Products, Inc.,** cleaning.
127 **Owens-Illinois,** containers.
152 **Pfaudler Permutit, Inc.,** centrifuge.
37 **Riegel Paper,** inner wrap.
38 **Robbins & Myers, Inc.,** pumping.
32 **Southwestern Supply & Machine Works,** lift.
173 **Spraying Systems Co.,** spray nozzles.
132 **Sprout-Waldron,** pneumatic conveying systems.
63 **Wm. J. Stange,** seasoning.
73 **Steelcote Mfg. Co.,** epoxy floor top.
102 **Stephens-Adamson,** vibrating feeder.
54 **Sterling Electric Motors, Inc.,** variable speed drive; applications.
2 **Sterwin Chemicals, Inc.,** ingredients.
1 **Stork & Co.,** sterilizer.
145 **Sunkist Growers,** tart gelled sauces.
114 **Surface Combustion,** toasting, drying, cooling system.
169 **Thermovac,** sanitary equipment (pumps, fittings).
100 **U. S. Stoneware Co.,** tubing.
18 **Urschel Labs, Inc.,** cutter.
171 **Viking Pump Co.,** rotary pumps.
103 **R. D. Webb & Co., Inc.,** flavors.
124 **Wheeling Stamping Co.,** plastic caps.
80 **J. O. Whitten Co., Inc.,** gelatin.
8 **York Corp.,** centrifugal compressors.

Product or Service Category Listing

Air Conditioning
Refrigeration

142 **Crushed ice maker,** Kohlenberger Engrg. Corp.
104 **Doors, sliding,** Jamison Cold Storage Door Co.
174 **Freezing without refrigeration,** Avco Corp.
112 **Liquid nitrogen,** Air Reduction Sales
208 **Platecoil,** Tranter Mfg., Inc.
211 **Platecoil, Tranter Mfg.,** Inc.

Cleaning & Sanitation

255 **Acid cleaner, powdered,** Hagan Chem. & Controls.
135 **Cleaning,** Oakite Products, Inc.
256 **Corrosion control systems,** Truscon Labs.
258 **Corrosion-proof floors,** Cellcote Co.
157 **Dust control, Day Co.**
453 **Floor-repair system,** Steelcote Mfg. Co.
452 **Floor sweeper, magnetic,** Erlez Mfg. Co.

Name ..... Title .....

Company .....

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Where ads offer more than one item, I've written key number and identity below

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MAY 1961

Expires July 31, 1961

IMPORTANT MUST INFORMATION

Please check in A & B below best description

A—Your Function

- ☐ 1. Administrative
- ☐ 2. Plant Operating
- ☐ 3. Tech.-Engineering
- ☐ 4. Other

B—Principal Product

- ☐ 1. Bakery Products
- ☐ 2. Beverages
- ☐ 3. Confectionery
- ☐ 4. Fruits & Vegetables
- ☐ 5. Grain Products
- ☐ 6. Meat, Poultry, Fish
- ☐ 7. Milk & Milk Products
- ☐ 8. Sugar & Sugar Products
- ☐ 9. All Other Foods
- ☐ 10. Multi-Foods (2 or More)

←**CHECK** *Important Must Information*

WRITE—*name, title, company and address*

CIRCLE—*number of items you want*

MAIL

253 **Insect-electrocutor,** Sno-Master Mfg. Co.
257 **Plant sanitation program,** Klenzade Pdts., Inc.
251 **Sanitary wall finish,** Master Mechanics Co.
115 **Sanitation,** Klenzade Pdts., Inc.
36 **Sludge collectors,** Link-Belt Co.
454 **Steam cleaning compound,** Delta Chem. Corp.
254 **Waste reduction kit,** Elliott Service Co.
252 **Wipers, disposable,** Kimberly-Clark.

Construction & Fabrication

73 **Epoxy floor top,** Steelcote Mfg. Co.
60 **Insulation board,** Dow Chemical Co.
201 **Steel floor plate,** Wood Steel Co.
221 **Teflon,** Cadillac Plastic & Chem. Co.

Disintegration Equipment

18 **Cutter,** Urschel Labs., Inc.
233 **Pulverizers,** Young Machinery Corp.
116 **Trimmer, tomato, F. H.** Langsenkamp Co.

Electrical Equipment

213 **Motordrives,** Reliance Electric & Engrg. Co.
219 **Motors,** U. S. Electrical Motors, Inc.
54 **Speed drive, variable,** Sterling Electric Motors, Inc.
410 **Speed drive, variable,** Sterling Electric Motors, Inc.

Equipment & Truck Leasing

304 **Truck fleet leasing,** Foundation for Management Research, Inc.
275 **Truck savings,** G.M.C. Truck & Coach Div.

Freezing Equipment

126 **Freezing, blast,** King Co.
203 **Freezing, turkey,** Cherry-Burrell Corp.
172 **Freezing unit,** Dole Refrigerating Co.
406 **Freezing unit, below zero,** Rail-Trailer Co.
269 **Refrigeration, in-transit,** Linde Co.

Ingredients & Additives

341 **Amylose films, edible,** A. E. Staley Mfg. Co.
108 **Ascorbic acid,** Merck Chem. Div.
14 **Beta carotene,** Hoffman-LaRoche, Inc.
68 **Beta carotene,** Hoffman-LaRoche, Inc.
339 **Cellulose,** Miles Chem. Co.
151 **Cellulose gum,** Hercules Powder.
342 **Cellulose, microcrystalline,** American Viscose Corp.
263 **Chemicals, surface active,** Hodag Chem. Corp.
338 **Citrus peel, dehydrated,** Sunkist Growers, Inc.
353 **Colors, oil soluble annatto,** Chr. Hansen's Labs., Inc.
336 **Corn adjunct, liquid,** Corn Products Co.
40 **Corn products,** Clinton Corn Processing Co.
343 **Dough developer, instant,** Western Condensing Co.
134 **Enzymes,** Miles Chemical Co.
129 **Flavor, beef,** Nestle Co.
350 **Flavor, dry fermentation,** Vico Pdts. Co.
261 **Flavor, natural fermentation,** Vico Pdts. Co.
117 **Flavors, rum,** Flavorex Co., Inc.
156 **Flavors,** Fritzsche Bros., Inc.
168 **Flavors,** International Flavors & Fragrances, Inc.
125 **Flavors, H. Kohnstamm & Co., Inc.**
167 **Flavors,** Norda.
103 **Flavors,** R. D. Webb & Co., Inc.
147 **Flavors, onion & garlic,** Dodge & Olcott.
354 **Fondant, dry, pre-cooked,** Amer. Molasses Co.
340 **Fruit cells,** Air Reduction Co.
80 **Gelatin,** J. O. Whitten Co., Inc.
359 **Glazes, nutritive,** Al-Chem Laboratory.
345 **Glucono-delta, lactone,** Chas. Pfizer & Co.
2 **Ingredients,** Sterwin Chemicals, Inc.
153 **MSG,** Merck & Co.
140 **Monoglycerides,** Distillation Pdts. Industries.
347 **Monoglycerides, acetylated,** Distillation Pdts. Industries.
357 **Oleoresins, Fritzsche** Bros., Inc.
358 **Powders,** shrimp & lobster, Norda.
337 **Preservatives,** Heyden Newport Chem. Corp.
344 **Protein,** hydrolyzed vegetable, Nestle Co.
77 **Proteins,** Griffith Laboratories, Inc.
346 **Safflower oil,** Pacific Vegetable Oil Corp.
356 **Salt substitute,** Sterwin Chems., Inc.
145 **Sauces, tart gelled,** Sunkist Growers, Inc.
63 **Seasoning,** Wm. J. Strange.
349 **Seasonings, dry spice,** Dodge & Olcott, Inc.
351 **Shortening, liquid,** Durkee Famous Foods.
146 **Silicone defoamers,** Dow Corning Corp.
99 **Silicone release agent,** Dow Corning Corp.
17 **Silicones,** Dow Corning Corp.
348 **Sodium erythorbate,** Merck & Co.
355 **Stabilizers, ice cream,** Amer. Food Labs., Inc.
84 **Starch,** Nat'l Starch & Chem. Corp.
101 **Sugars, starches, syrups,** Corn Pdts. Co.
352 **Supplement, high protein,** Griffiths Labs., Inc.
122 **Whey, spray-dried sweet,** Kraft Foods.
262 **Whey, sweet dairy,** Western Condensing Co.
136 **Yeast,** Lake States Yeast & Chem.

Instruments, Measurement & Control

390 **Checkweigher,** Food Machinery & Chem. Corp.
280 **Computer components, analog,** Embree Electronics Corp.
282 **Controllers, electronic,** Minneapolis-Honeywell Regulator Co.
283 **Controls, liquid level,** B. W. Controller Corp.
281 **Counter, impulse,** Automatic Timing & Controls, Inc.
419 **Electronic balance, precision,** Cahn Instrument Co.
39 **Meter, flow,** Foxboro Co.
9 **Meters,** Buffalo Meter
149 **Meters,** Neptune Meter
225 **Process planning,** Wizard Gauge Co.
418 **Sampler, automatic,** Nat'l Instrument Co.
284 **Scales, Weigh-counting,** Detecto Scales, Inc.
417 **Spectrophotometer,** Perkin-Elmer Corp.
411 **Switch, level-warning,** Machine Works
128 **Thermos-couple,** Minneapolis-Honeywell
222 **Thermos-couple,** Minneapolis-Honeywell
405 **Thermometer, bi-metal,** Industrial Service Co.
16 **Thermometers,** Autolite
403 **Weigher,** Mercury Heat Sealing Equipment Co.

Management Services

293 **Armed Forces markets,** Military Subsistence Supply Agency
291 **Consumer promotions,** A. C. Nielson Co.
292 **Distillers marketing survey,** American Newspaper Publishers Assn., Inc.
301 **Personnel mobility,** Victor Adding Machine Co.
294 **Salesmanship,** effective, Small Business Administration
302 **Secondary boycotts,** U. S. Chamber of Commerce

Materials Handling

408 **Belt lacer,** Clipper Belt Lacer Co.
272 **Bulk & package handling conveyors,** Conveyor Systems, Inc.
401 **Bushings, chains, plastic,** Chain Belt Co.
246 **Can line automation,** Peco Corp.
139 **Conveyor belts,** B. F. Goodrich
150 **Conveyor belts,** La Porte Mat & Mfg. Co.
451 **Conveyor belts,** Sellers Injector Corp.
266 **Conveyor belts, sanitary,** Ton-Tex Corp.
273 **Conveyors, screw,** Thomas Conveyor Co.
207 **Conveyor belts, stainless steel,** Sandvik Steel, Inc.
271 **Conveyors, trolley,** Link-Belt Co.
227 **Egg handling system,** Food Machinery & Chem. Corp.
102 **Feeder, vibrating,** Stephens-Adamson
268 **Feeders, volumatric,** Wallace & Tiernan, Inc.
267 **Handling costs,** Automatic Transportation Co.

MAY 1961

Expires July 31, 1961

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- ☐ 7. Milk & Milk Products
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Company .....

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32 **Lift,** Southwestern Supply & Machine Works
384 **Loader, automatic,** Integral Packaging Systems
415 **Loader, versatile,** Fort Worth Steel & Machinery Co.
270 **Materials handling automation,** General Electric Co.
407 **Packer, self-loading,** Dempster Bros., Inc.
132 **Pneumatic conveying systems,** Sprout-Waldron
409 **Screw conveyor drive,** Dodge Mfg. Co.
412 **Takeup frames, versatile,** Link-Belt Co.
119 **Tank, milk,** Creamery Package Mfg. Co.
206 **Trays, polyethylene confection,** W.R.H. Products Co.
274 **Unit with built-in charger,** Lewis-Shepard Pdts.

Mixing Equipment

94 **Batch machine,** Centrico, Inc.
232 **Blenders,** First Machinery Corp.
402 **Blending system, electronic,** Fischer & Porter Co.
13 **Homogenizer,** Cherry-Burrell
235 **Homogenizers, ultrasonic,** Sonic Engrg. Corp.
234 **Ingredient feeder,** Creamery Package Mfg. Co.
118 **Mixers, grinder, blender,** Koch Supplies, Inc.
155 **Mixers,** Mixing Equipment Co., Inc.

Moisture Removal Equipment

230 **Drying, freeze,** Vickers-Armstrong.
148 **Dryers, spray,** Nichols Engineering.
42 **Drying, vacuum,** Chemetron Corp.
114 **Toasting, drying, cooling system,** Surface Combustion.

Packaging Equipment

380 **Accumulator-bundler,** Hayssen Mfg.
385 **Applicator, hot-melt,** National Starch & Chemical Co.
381 **Bag placer,** Raymond Bag Corp.
62 **Pouch Packaging,** Food Machinery & Chemical Corp.
387 **Sealer,** Lily Tulip Cup Corp.
388 **Sealer, semi-automatic,** Doughboy Industries.
247 **Sealer, universal,** Packaging Equipment Co.
383 **Set up machine,** Stone & Forsyth.
240 **Set up paper box machinery,** Food Machinery & Chemical Corp.
391 **Shipping case former,** Schroeder Machines Corp.
392 **Uncaser,** Climax Products.
312 **Wrapping machine,** Hayssen Mfg. Co.

Packaging Materials

314 **Aerosol, free piston,** American Can Co.
124 **Caps, plastic,** Wheeling Stamping Co.
396 **Carton, plastic lined,** Kapak Products.
241 **Cellophanes,** DuPont de Nemours & Co.
322 **Cellophanes,** DuPont de Nemours & Co.
394 **Cellophanes,** DuPont de Nemours & Co.
313 **Cellophanes,** Olin Mathieson Chemical Corp.
394 **Cellophanes,** Olin Mathieson Chemical Corp.
317 **Closures, jar,** Crown Cork & Seal Co.
244 **Coatings, foil color,** Ekco Alcoa Containers, Inc.
245 **Coatings, release paper,** General Electric.
127 **Containers,** Owens-Illinois
248 **Containers, aluminum foil,** Kaiser Aluminum & Chemical Corp.
315 **Containers, glass,** Thatcher Glass Mfg. Co.
144 **Gas packaging,** Gas Atmospheres.
37 **Inner wrap,** Riegel Paper.
311 **Jars, light weight,** Continental Can Co.
316 **Jar, wide mouth,** Owens-Illinois Co.
397 **Paper, plastic lined,** Waldorf Paper Products.
395 **Plastic-paper combinations,** Dixie Cup Co.
399 **Poly, high density,** DuPont de Nemours & Co.
390 **Poly, high density,** Phillips Petroleum Co.
318 **Resin, polyfilm,** Monsanto Chemical Co.
320 **Thermos bottle,** Stone Container Corp.
143 **Tin,** Malayan Tin Bureau.
242 **Wrapping and sealing, film,** Crompton & Knowles Packaging Corp.

Pipes, Valves, Tubing, Spray Nozzles, Traps

223 **Atomizing nozzles,** Schutte & Koerting Co.
214 **Pipe, glassed,** Pfaudler Permutit, Inc.
169 **Sanitary Equipment,** Thermovac.
173 **Spray nozzles,** Spraying Systems, Co.
82 **Traps, magnetic,** Ladish Co.
100 **Tubing,** U. S. Stoneware Co.
220 **Valves,** Airmatic Valve, Inc.
239 **Valves, dispensing,** Clayton Corp.
130 **Valves, fittings,** Grinnell Co.

Plant Services

5 **CO2 and Nitrogen,** DeMarkus Corp.
216 **Conduiets,** Crouse-Hinds Co.
243 **Cartoning machines,** Continental Can Co.
4 **Case sealer, automatic,** ABC Packaging Machine Corp.
377 **Container machine,** Bemis Brothers Bag Co.
6 **Filler,** Food Machinery & Chemical Co.
378 **Filler, liquid or viscous,** Lily-Tulip Cup Corp.
386 **Glue saver,** American Can Co.
389 **Heat seal checker,** Precision Machine & Development Co.
170 **Imprinter,** Gottscho.
414 **Imprinter, carton,** Gottscho.
205 **Interleaver, automatic,** Toby Enterprises.
393 **Labeler, pressure sensitive,** Kleen-Stik Products.
379 **Packager, stretch,** Lynch Corp.
162 **Packaging equipment,** Ekco-Alcoa Containers, Inc.
416 **Packaging unit, fish-stick,** American Can Co.
382 **Packer, air flow,** Crown Zellerbach.
375 **Pouch maker,** Bartlett Engineering.
376 **Pouch maker, versatile,** Food Machinery & Chemical Corp.

Power and Steam Generating

212 **Boiler,** Orr & Sembower, Inc.

Power Transmission Equipment (Mechanical)

217 **Bearings,** Arguto Oilless Bearing Co.

Processing Equipment (Heat)

138 **Baking ideas,** American Baker Assoc.
224 **Converters, hot water,** Niagara Weldments, Inc.
231 **Cooking system, jet,** A. E. Staley Mfg. Co.
226 **Cooking utensils, aluminum,** Wear Ever Aluminum, Inc.
218 **Immersion heaters,** Heatrex, Inc.
76 **Oven, infrared,** Fostoria Corp.
413 **Pasteurizer-cooler,** Standard Metal Products Co.
1 **Sterilizer,** Stork & Co.
36 **Tanks,** Chester-Jensen Co., Inc.
404 **Tilting kettle, powered,** Groen Mfg. Co.

Pumps and Air Compressors

8 **Compressors, centrifugal,** York Corp.
38 **Pumping,** Robbins & Myers, Inc.
215 **Pumps, centrifugal,** Goulds Pumps, Inc.
171 **Pumps, rotary,** Viking Pump Co.

Separation Equipment (Wet)

229 **Centrifugals,** American Machine & Metals Inc.
133 **Centrifuges, filters,** Dorr-Oliver Inc.
152 **Centrifuge,** Pfaudler Permutit Inc.
81 **Filter paper,** Filter Paper Co.
120 **Filtration, additive,** Dicalite, Great Lakes Carbon Corp.
228 **Water stills,** F. J. Stokes Corp.

Shipping Containers

137 **Stainless steel enclosures,** General Electric.

TV, Radio and Print

303 **Business communications,** Theater Network Television, Inc.

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